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AMERICAN ACADEMY
of
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MARCH - APRIL
1954

Volume 58 Number 2

ANNUAL MEETING, SEPTEMBER 19-24, 1954, NEW YORK

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TABLE OF CONTENTS

PAGE

SOME CONTRIBUTIONS OF LABORATORY RESEARCH TO THE DEVELOPMENT OF FENESTRATION SURGERY 147
Wherry Memorial Lecture
GEORGE E. SHAMBAUGH, JR., M.D., Chicago, Ill.

SYMPOSIUM: THE PROBLEM OF NOISE IN INDUSTRY

A HISTORY OF RECENT YEARS 156
GORDON D. HOOPLE, M.D., Syracuse, N. Y.

REPORT OF THE FIELD REPRESENTATIVE 163
DOUGLAS E. WHEELER, PH.D., Los Angeles, Calif., by invitation

MEDICOLEGAL ASPECTS 167
C. STEWART NASH, M.D., Rochester, N. Y.

THE OTOLARYNGOLOGIST IN THE INDUSTRIAL NOISE PROBLEM 170
ARAM GLORIG, JR., M.D., Washington, D. C.

A STUDY OF THE ROLE OF TOXOPLASMOSIS IN ADULT CHORIORETINITIS 172
ALAN C. WOODS, M.D., Baltimore, Md., LEON JACOBS, PH.D., by invitation, RONALD M. WOOD, PH.D., by invitation, and M. KATHERINE COOK, by invitation, Bethesda, Md.

SEROLOGIC DATA ON ADULTS WITH HISTOLOGICALLY DIAGNOSED TOXOPLASMIC CHORIORETINITIS 193
LEON JACOBS, PH.D., by invitation, M. KATHERINE COOK, by invitation, Bethesda, Md., and HELENOR CAMPBELL WILDER, Washington, D. C.

ANTIHYALURONIDASE AND ANTISTREPTOLYSIN TITERS IN UVEITIS 201
IRVING H. LEOPOLD, M.D., and THOMAS G. DICKINSON, M.D., Philadelphia, Pa.

MARFAN'S SYNDROME (ARACHNODACTYLY) WITH ECTOPIA LENTIS 212
MERRILL J. REEH, M.D., and WILLIAM L. LEHMAN, M.D., by invitation, Portland, Ore.

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TABLE OF CONTENTS *(Continued)*

PAGE

The Role of Vitreous Detachment in Aphakic and Malignant Glaucoma 217
Robert N. Shaffer, M.D., San Francisco, Calif.

In Memoriam 232

EDITORIALS

The Fifty-Ninth Annual Convention 233

Continuation Discussion Cruise 234

New Secretaries for the Home Study Courses 235

C. I. O. M. S. 235

Announcement of the Sixth International Congress of Otolaryngology 236

International Association of Eye, Ear, Nose and Throat Society Secretaries 238

Meetings of Foreign Societies 238

Helenor Campbell Wilder 241

Section on Instruction 242

Book Review 324

News Notes XXXI

Positions Available XXXIII

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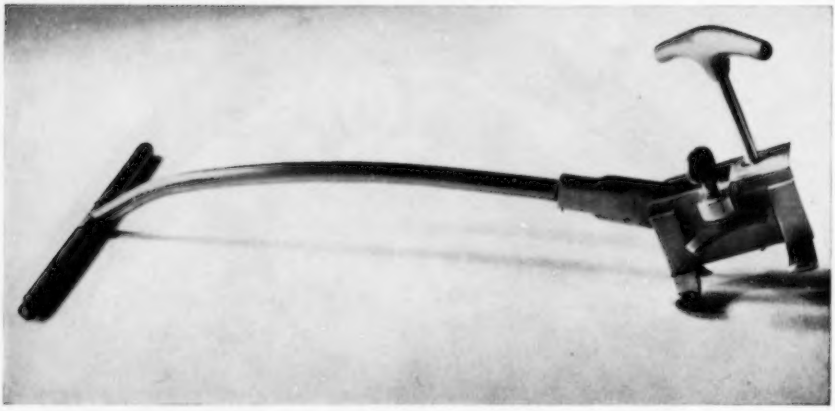

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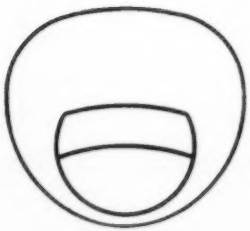

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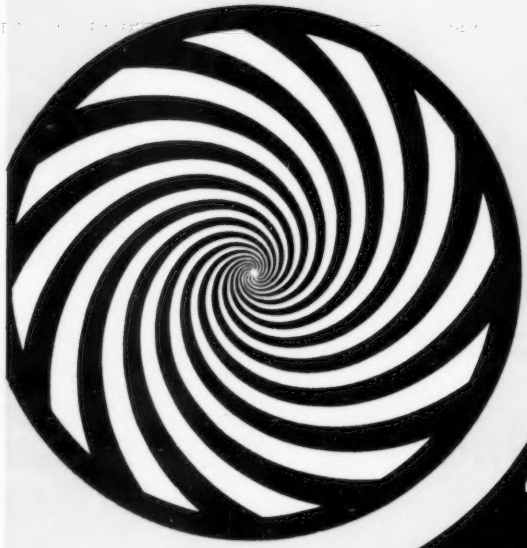

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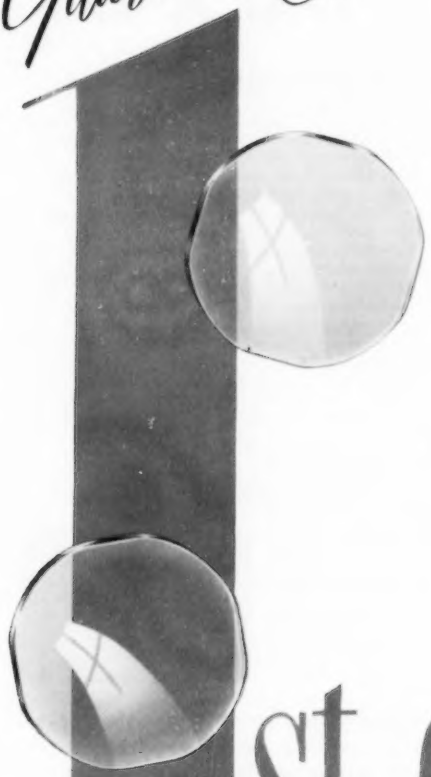

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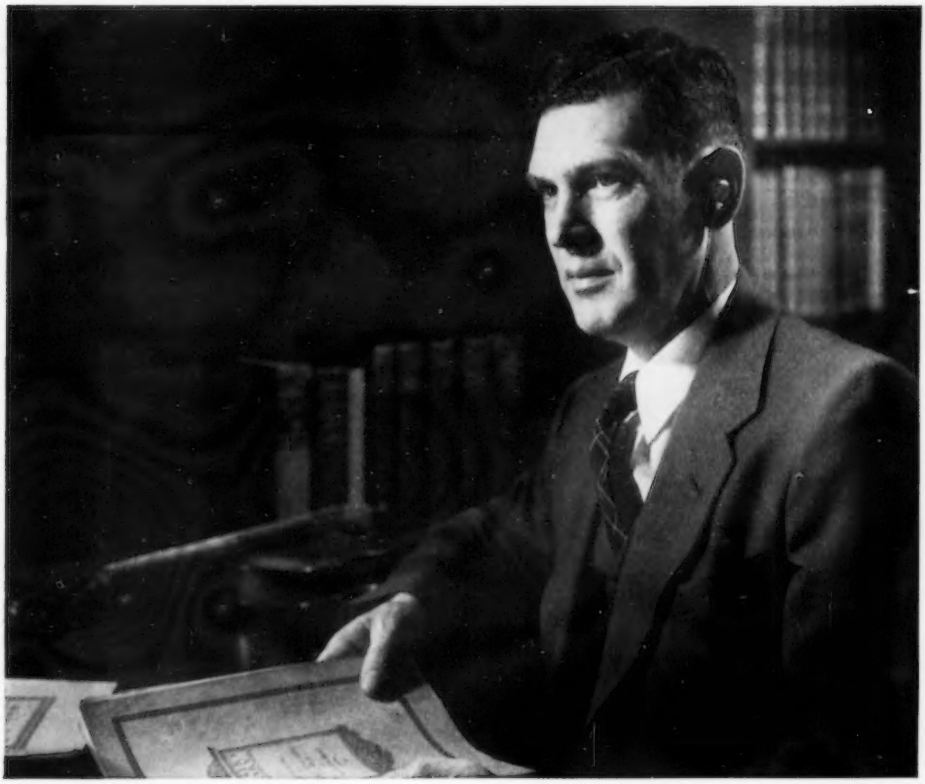

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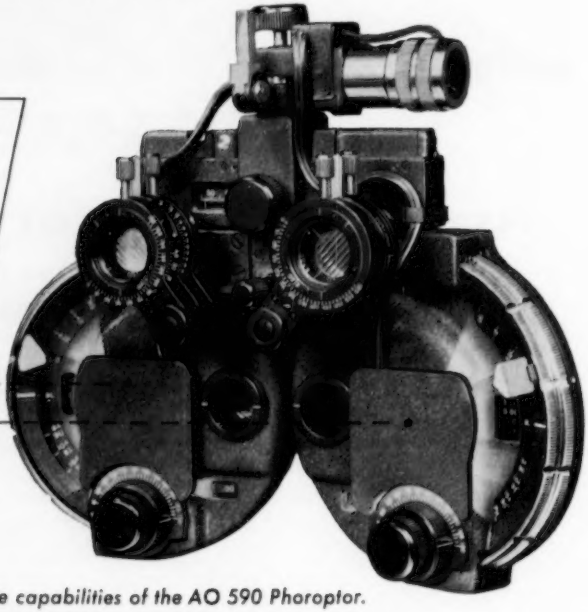

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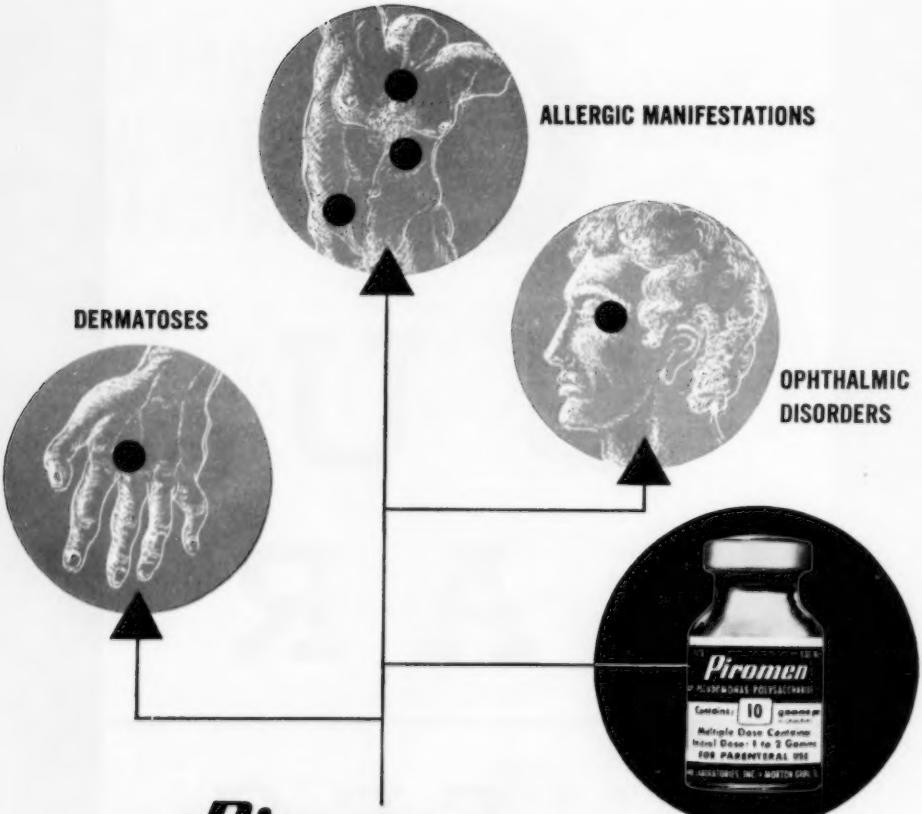

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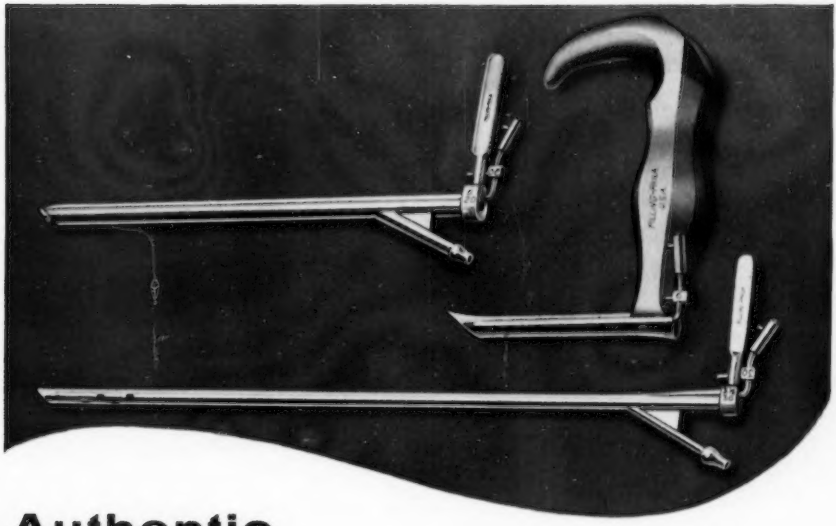

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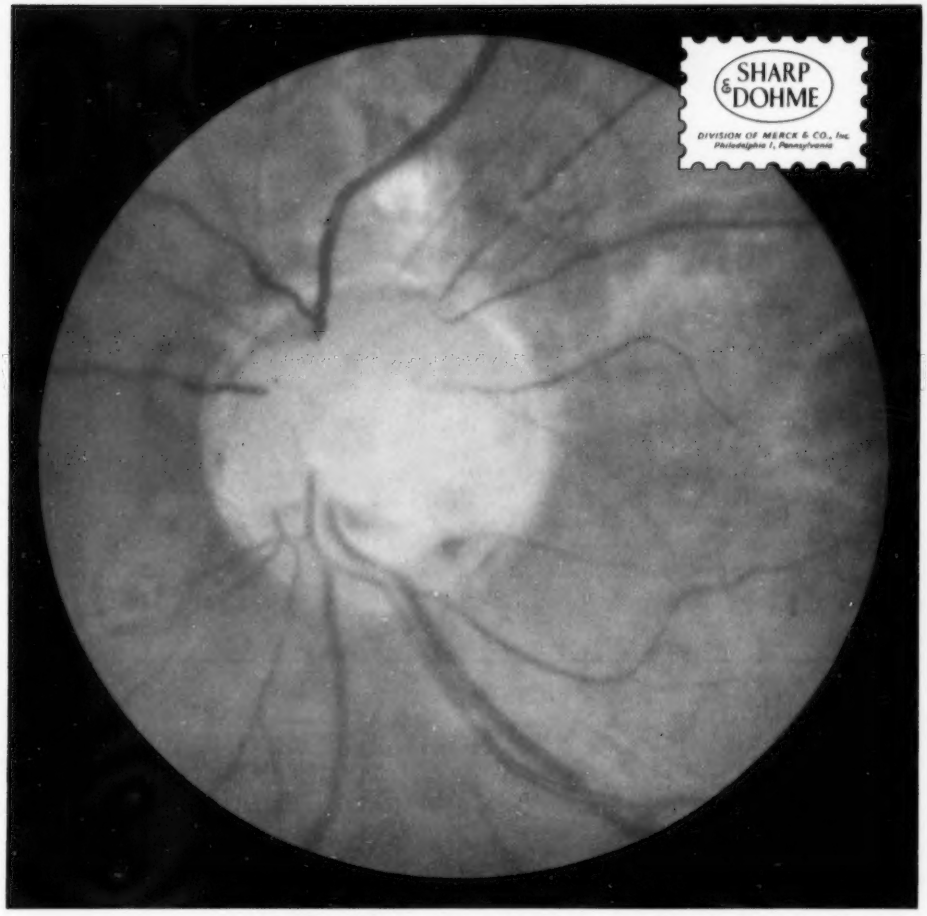

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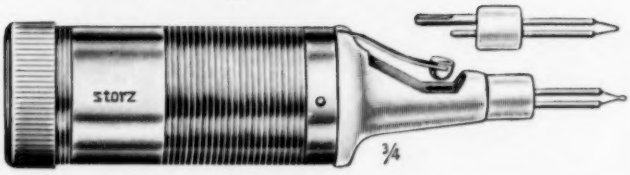

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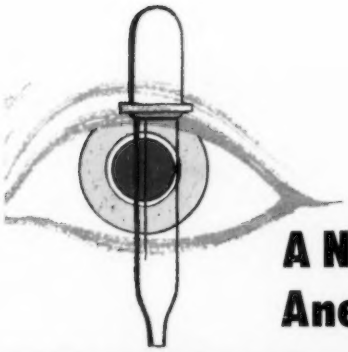

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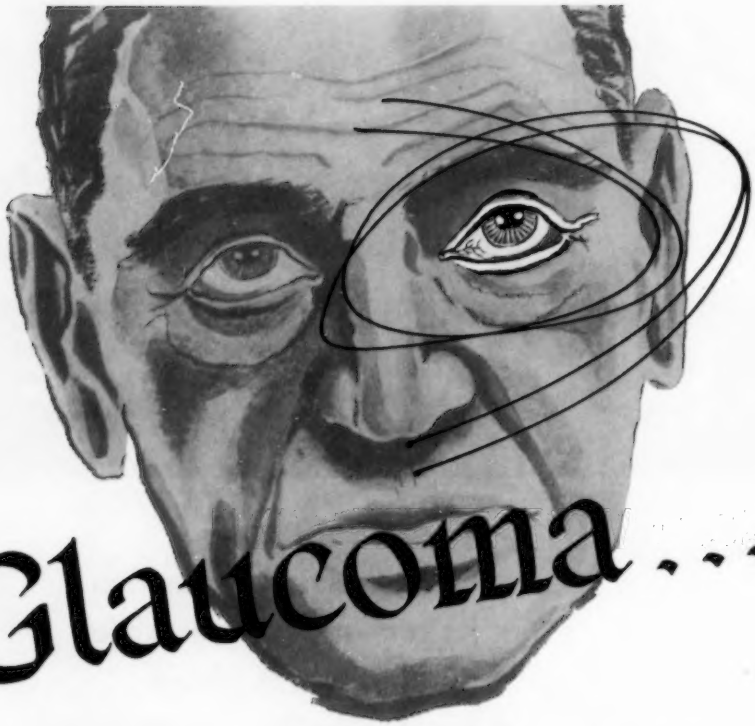

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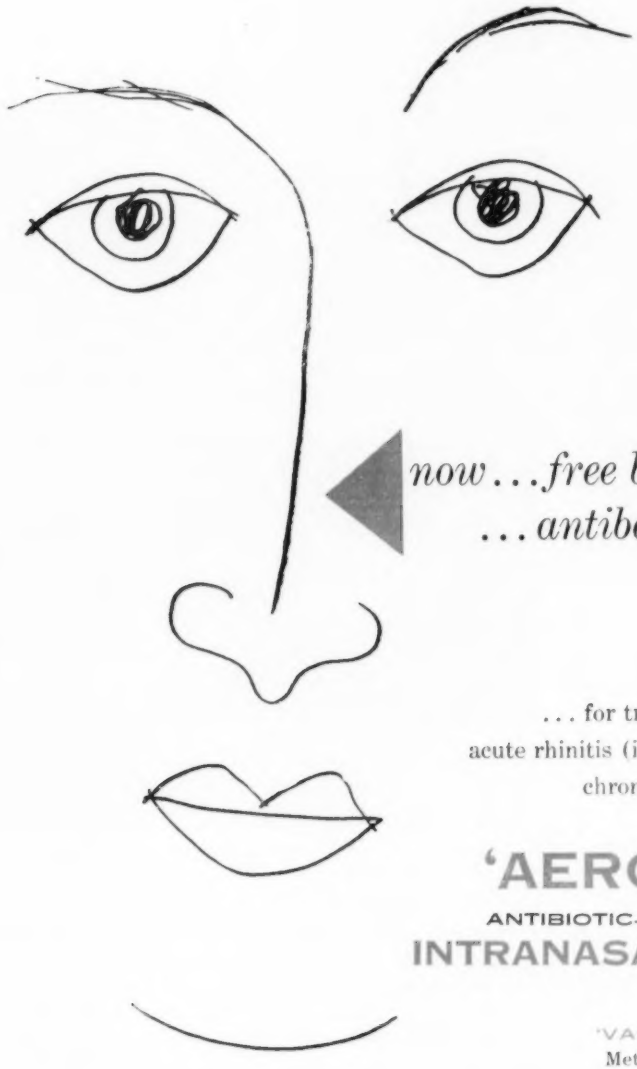

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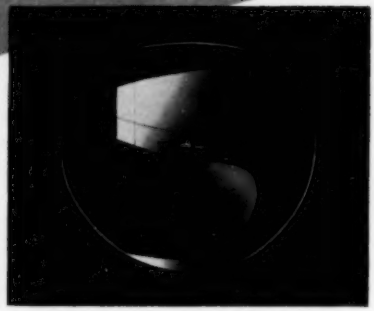

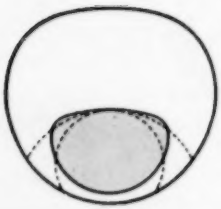

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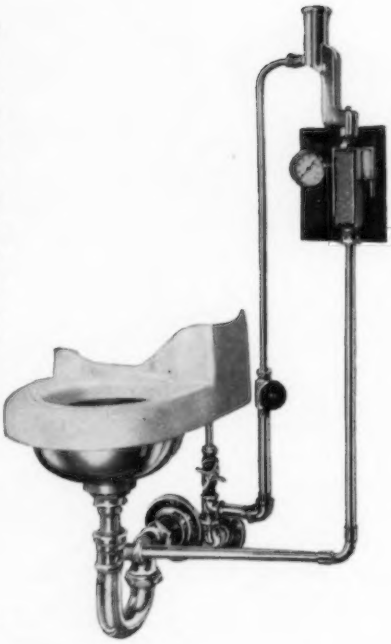

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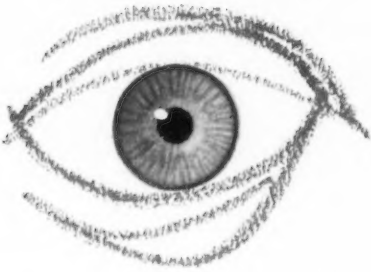

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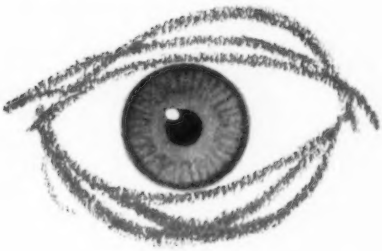

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1. Gettes, B. C., and Leopold, I. H.: A. M. A. Arch. of Ophth. 49:24 (Jan.) 1953.
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Wherry Memorial Lecture

SOME CONTRIBUTIONS OF LABORATORY RESEARCH TO THE DEVELOPMENT OF FENESTRATION SURGERY

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ONE OF the great appeals of a doctor's career is that there is so much that is still unknown about disease that each one of us has the opportunity to pioneer. By means of clinical research we may help to explore and to advance just a little the exciting frontiers of medical science. But clinical research by itself has limitations, for one cannot compromise the welfare of the patient for the sake of scientific curiosity. The experimental animal, therefore, has become an indispensable tool for the solution of difficult clinical problems. An outstanding example is the surgical treatment of otosclerosis, which owes much of its present success to laboratory research.

The history of the development of the fenestration operation reveals four great problems that were encountered. The first was infection of the labyrinth, which caused some of the early operations to end tragically in suppurative meningitis. For a while the whole proposition of attempting to operate to restore hearing in otosclerosis was condemned as both futile and dangerous. The first step forward was taken by Gunnar Holmgren in 1917, who demonstrated that the labyrinth could be opened safely providing the rules of modern surgical aseptic technic were strictly adhered to.

A second problem encountered by Jenkins, Bárány and Holmgren, was osteogenic closure of the fenestra, and for a time this threatened to become an insuperable obstacle. A ray of hope came when Maurice Sourdille, after a visit with Holmgren in 1924, began to cover the fenestra with a thin pedicle skin flap from the meatus. Sourdille's "tympanolabyrinthopexy" for the first time restored good permanent hearing to patients with otosclerosis. In 1947, I had the interesting experience of a month with Professor Sourdille in Strasbourg. During this time I examined and tested the hearing of two of his successful cases, one operated upon in 1932, the other in 1935. In both patients a wide open fenestra in the horizontal semicircular canal was clearly visible through the thin skin lining the beautifully healed and dry operative cavity. Both patients had maintained an excellent hearing improvement, one for twelve years, the other for fifteen years. But despite Sourdille's brilliant success in some cases, osteogenic closure continued to be a major obstacle. When Julius Lempert in 1937 improved upon Sourdille's two-stage or three-stage technic by the one-stage endaural fenestration operation, closure of the fenestra still remained the chief cause for failure.

The third problem of fenestration surgery was the sterile inflammatory reaction in the labyrinth that follows surgical exposure of its contents. While

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generally mild and of brief duration, this postoperative serous labyrinthitis in some cases was more severe and resulted in permanent cochlear damage.

The fourth problem was clearly defined by Davis and Walsh in 1950 as the residue of unrestored conductive loss after successful fenestration. This residue, which averages about 25 decibels for the speech frequencies, limits the amount of improvement gained by operation and prevents the restoration of normal hearing.

The contributions of animal research have been toward the solution of the second and third of these problems: the problem of osteogenic closure and the problem of postoperative serous labyrinthitis.

Holmgren and Engstrom were the first to turn to the laboratory for help, and Canfield and Fowler, Jr., were other early pioneers in animal experiments on the problem of closure of the fenestra. In 1940 a series of experimental studies that are still in progress were begun at Northwestern University, and soon afterward Lindsay at the University of Chicago and Lempert and his associates began similar studies.

In this description of the contributions of laboratory research to the development of fenestration surgery, I shall draw mainly on our studies at Northwestern, but this does not imply that the other research was not equally significant and informative. Each investigator attacked the problem from a slightly different angle, and the combined efforts of all contributed to the final result. And indeed, this has been true of nearly all important scientific and medical advances.

Our laboratory experiments were patterned after those of Holmgren and Engstrom and were on the ear of the rhesus monkey, which so closely resembles the human ear in its anatomic structure. The surgical technic employed on the human was duplicated as nearly as possible on the monkey with nembutal anesthesia, complete surgical asepsis in the operating room, the construction of a plastic tympanomeatal skin flap by means of special tiny elevators, and the creation of the fenestra with the aid of the operating microscope. As a rule one ear of a monkey was operated upon by the fenestration technic being used on patients while the opposite ear was operated upon by some modification, thus affording controls. The animals were sacrificed at varying intervals after operation and the ears prepared for histologic study.

It is fascinating and instructive to correlate the clinical course experienced by the fenestrated patient with the histologic changes observed in the experimental animal sacrificed at a comparable time after operation.

Immediately after fenestration of his labyrinth the patient, still "dopey" from his preoperative sedation, is quiet and comfortable, but within a few hours vestibular symptoms appear with vertigo, ataxia, nausea and, frequently, vomiting. A spontaneous nystagmus, usually toward the unoperated ear, may be observed. After several days these vestibular symptoms subside, but at the same time in certain patients a depression of cochlear function may be observed beginning four to seven days after operation with a shift of the Weber test to the unoperated ear and a depression in the bone conduction audiogram.

Three days after fenestration the monkey (fig. 1) shows marked hyperemia and edema of the tympanomeatal skin flap with the escape of blood into the connective tissue of the flap and into the perilymph space of the labyrinth. Four days after operation another monkey shows a cellular reaction of the arachnoid mesh to the presence of blood, and some blood has diffused into the

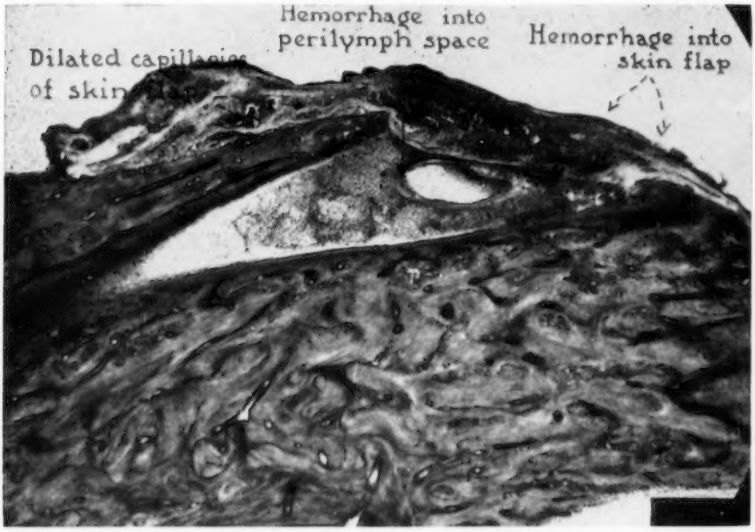

FIG. 1—Fenestra three days postoperatively showing reaction in flap with bleeding into perilymphatic space.

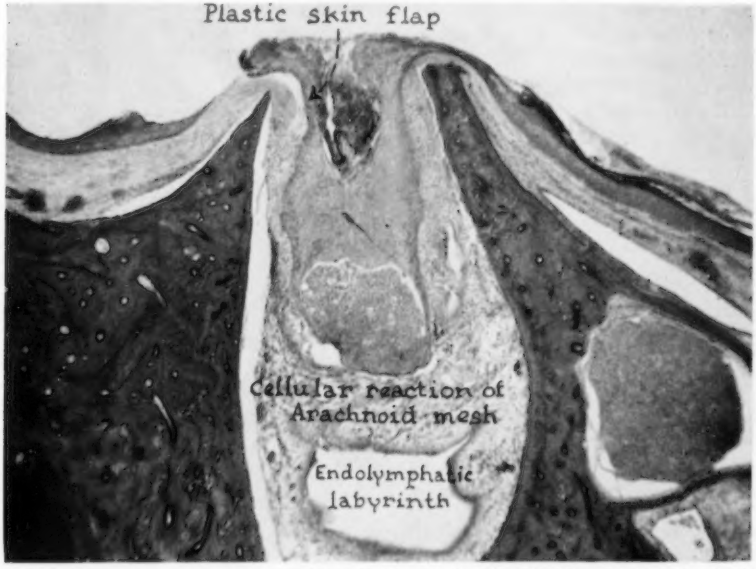

FIG. 2—Fenestra seven days postoperatively showing reaction of arachnoid mesh of perilymphatic space due to infection in cavity.

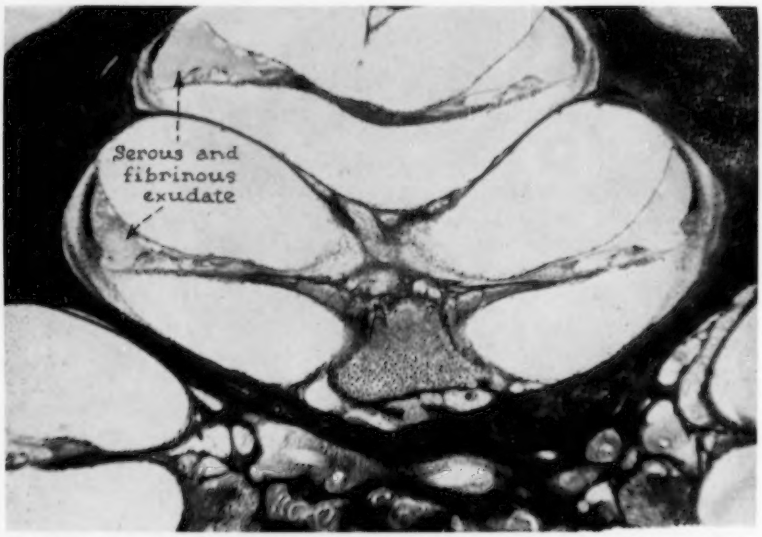

FIG. 3—Cochlea of same monkey as in figure 2 seven days postoperatively showing exudate in cochlear duct.

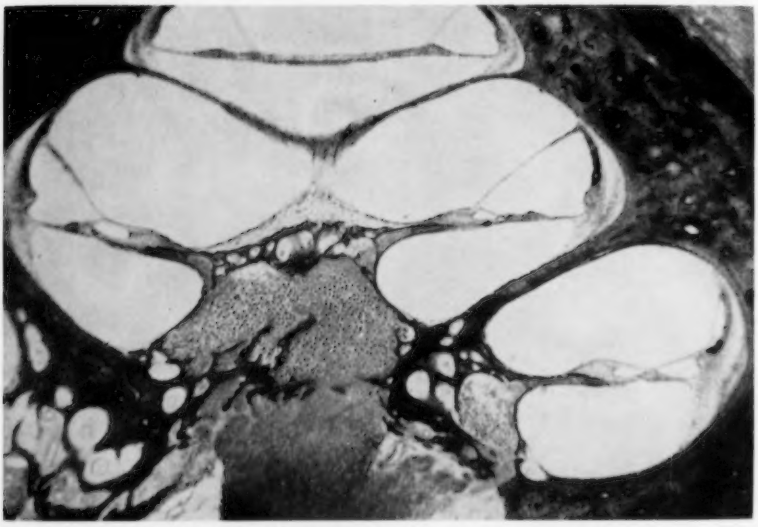

FIG. 4—Degenerated organ of Corti three weeks postoperatively.

perilymphatic duct of the cochlea. Seven days after operation (fig. 2) an infection of the operative cavity, with pus against the invaginated skin flap, has accentuated the inflammatory arachnoiditis of the semicircular canal, without an actual suppurative invasion of the labyrinth. In one specimen (fig. 3) the cochlea is involved with a fibrinous exudate in the endolymphatic duct. We may surmise a depression in cochlear response in this monkey similar to that seen in some patients seven days after fenestration.

The average patient has pretty well recovered from his initial serous labyrinthitis by the third week after operation. He can now walk steadily, and his hearing is rapidly improving from the temporary depression that occurred around seven days postoperatively. But in a small percentage of patients the cochlear damage is irreversible and there is a permanent depression in hearing. The degeneration of the organ of Corti seen in a monkey three weeks after operation (fig. 4) could represent the appearance of the cochlea of those few patients whose hearing is made worse by the fenestration operation.

In the early days of the Lempert fenestration operation the initial good hearing improvement achieved a few weeks after operation soon began to recede in many cases, until it reached the original preoperative level. At the same time the strongly positive fistula test became weaker or disappeared. Revision would reveal an osseous closure of the fenestra.

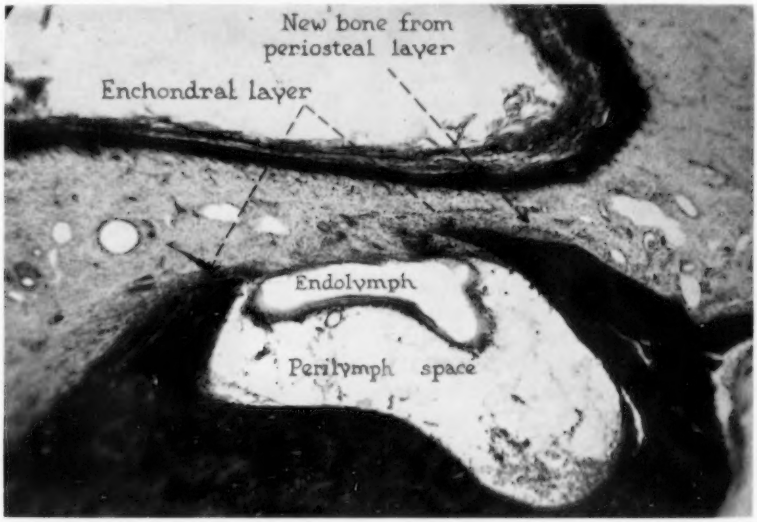

FIG. 5—Osteogenesis beginning seven days postoperatively from periosteal layer of the capsule.

In the fenestrated monkey osteogenesis may be detected as early as one week after operation, first as osteogenic buds into the thickened mucosa of the mastoid air cells, and then as a border of new bone from the outer periosteal layer of the labyrinthine capsule near the fenestra (fig. 5). Animal experiments clearly demonstrate that the middle endochondral layer of the capsule responds to trauma with osteogenesis less readily than does the outer peri-

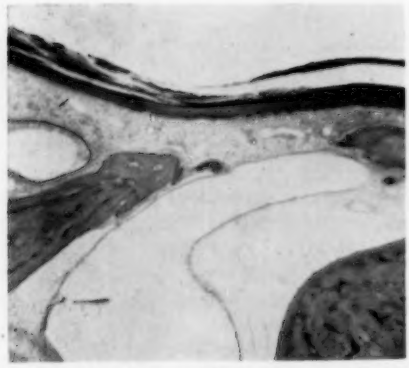

FIG. 6—Bone dust particle in fenestra with new bone formation around it.

osteal layer. Thus the first principle in constructing a fenestra that will remain open is to remove the outer periosteal layer, widely exposing the osteogenically less active endochondral layer.

When bone dust particles are left in the mouth of the fenestra of the monkey, osteogenic repair of the fistula is accelerated. Nager, who examined the first temporal bones of monkeys operated upon by Holmgren,* observed the extremely rapid closure of the fenestra produced by bone dust. Even a single microscopic particle of bone dust can lead to new bone formation around it (fig. 6). The second principle in preventing closure is to keep the region of the fenestra immaculately clean of bone dust. We believe that continuous irrigation and the operating microscope help to attain this objective.

The relative success of Sourdille's tympanolabyrinthopexy, as compared to previous attempts to keep the labyrinthine window open, is explained by the laboratory experiments. A fenestra covered by fascia (fig. 7) or other material is more likely to close than one covered by skin. The closer the epithelium is to the bone, the greater the inhibiting effect on osteogenesis (fig. 8).

* Personal communication to the author.

An extremely important factor in osteogenic closure of the fenestra brought out by the experimental studies is the endosteal membrane that lines the labyrinth. If this membrane is injured or stripped (fig. 9), osteogenesis begins from the denuded surface. If the endosteum remains intact to the outermost edges of the fenestra where it will come into contact with the periosteum of the flap, the cut bone edges may be said to be "healed by first intention" with less tendency toward new bone formation.

Animal experiments clearly show the osteogenic effect of new fibrous tissue. Fibrous tissue in the perilymphatic space of the semicircular canal may be a result of serous labyrinthitis and may lead to osteogenic obliteration of the perilymphatic space (fig. 10).

Finally, the monkey has shown us that a polished bone surface produces new bone less readily than an unpolished surface.

As these six factors that influence osteogenesis after fenestration have become known and as the knowledge has been applied to the operation on the human patient, failures due to closure have been reduced until today they occur in not more than 1 per cent or 2 per cent of operations. The precise technic employed is not as important as the fact that the technic achieves the objectives of a fenestra lying on top of a dome with wide exposure of the endochondral bone around it, that it be immaculately free from microscopic particles of bone dust, that the endosteum within the labyrinth remain intact to the outermost edges of the fenestra, that the bone around the fenestra be polished, that the perilymph space remain free from blood and that the plastic skin flap fit tightly against the margins of the fenestra in contact with the endosteum.

Naturally one must be guarded in making too close comparisons between the experimental animal and the human

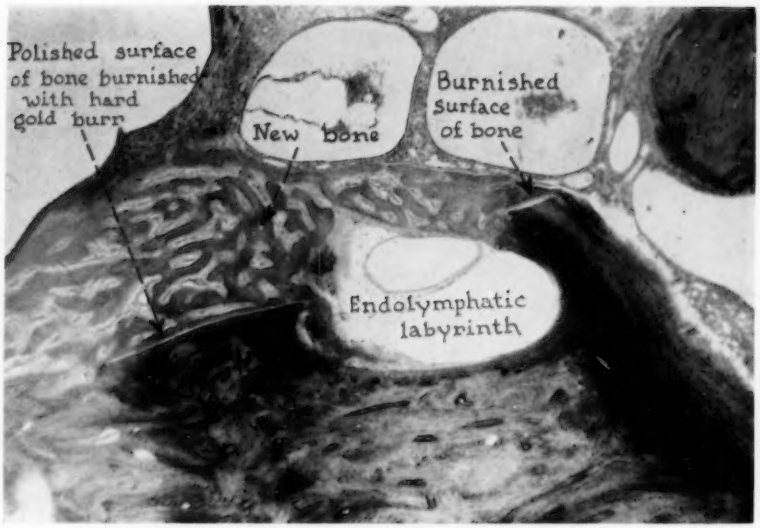

FIG. 7—Fenestra covered with fascia closed by new bone.

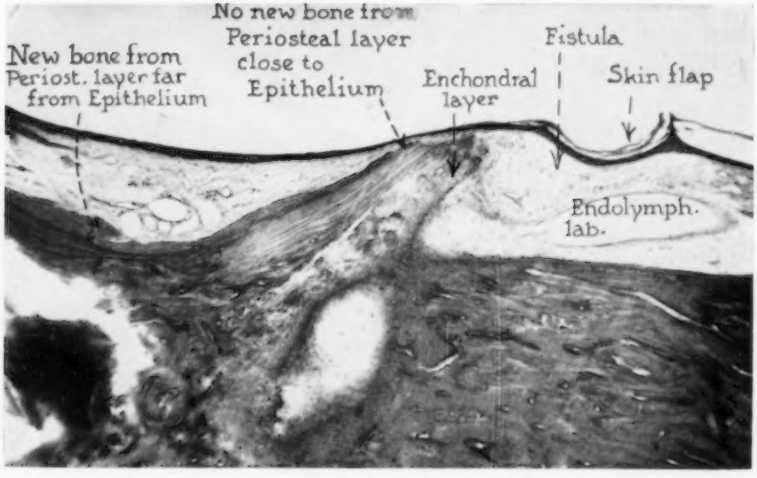
No new bone from Periosteal layer close to Epithelium
New bone from Periost. layer far from Epithelium
Fistula
Enchondral layer
Skin flap
Endolymph. lab.

FIG. 8—Inhibiting effect of stratified squamous epithelium on osteogenesis.

FIG. 9—Osteogenesis from underlying bone where endosteum was stripped.

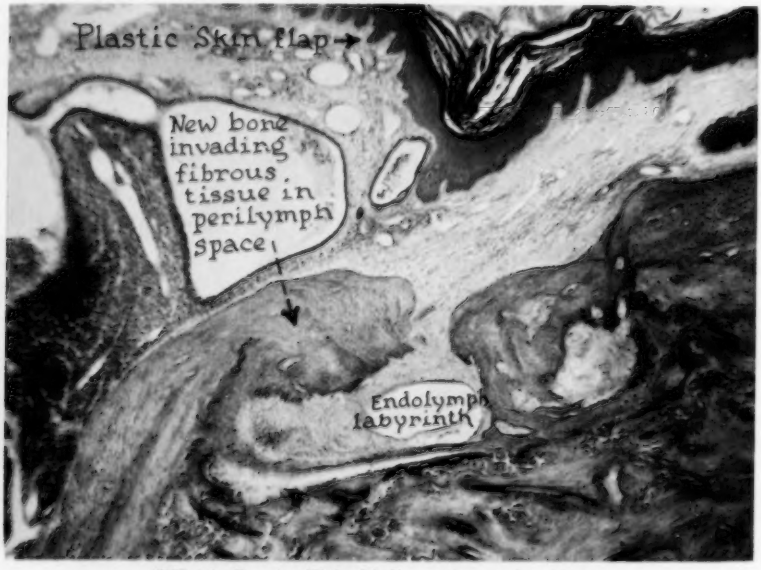

FIG. 10—Fenestra filled with fibrous tissue and new bone.

patient. Nevertheless, the experimental studies clearly demonstrate that postoperative serous labyrinthitis is a sterile inflammatory reaction of the labyrinthine contents incited by the traumatic inflammation of the skin flap over the fenestra, with exudation of blood and serum into the perilymphatic space of the labyrinth. Infection of the operative cavity accentuates the inflammation of the flap and the resultant sterile labyrinthitis, without necessarily causing a suppurative labyrinthitis. In the experimental animal postoperative serous labyrinthitis begins at the fenestra and then spreads to the cochlea. This is in complete accord with clinical experience where the initial labyrinthine symptoms are vestibular, followed in a few days by the depression of cochlear function.

The *prevention* of postoperative serous labyrinthitis clearly depends upon complete absence of infection in the cavity and minimizing or preventing the entrance of blood and exudate into the fenestra. An extremely meticulous and strict aseptic technic with elastic sponge packing against the flap was introduced a few years ago to lessen the edema and passive congestion of the flap, and this did diminish appreciably the frequency of severe postoperative labyrinthitis with permanent cochlear damage. Recently a new method has been used to further decrease postoperative labyrinthitis. This consists in covering the fenestra with a split thickness free skin graft instead of the usual pedicle tympanomeatal skin flap. The split thickness graft appears to have these advantages: it has, at first, no blood supply to cause an inflammatory hyperemia and edema, with exudation of blood and serum into the fenestra; it is very thin and pliable, clinging closely to the margins of the fenestra, to insure contact with the endosteum; and it is free from any adherent bone particles that might escape detection and contribute toward osteogenic closure.

It is too early to make any claims for this technic, which is not original with us but has been used by a number of European otologists. At least 100 consecutive cases operated upon by this technic and followed for a minimum of one year will have to be compared with 100 cases operated by the usual Sourdille pedicle flap before any conclusions can be reached. All that can be said at this time is that in view of the laboratory studies, the split thickness free graft technic is logical, is worth a clinical trial, and the preliminary results are encouraging.

In conclusion, the increased understanding of the mechanism of postoperative serous labyrinthitis that has come from laboratory research promises to result in a technic that will reduce the failures from this cause. The great and at one time almost insuperable problem of bony closure owes its solution in large part to the clear demonstration by animal experiments of the factors that influence osteogenesis at the fenestra.

A HISTORY OF RECENT YEARS

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SO MUCH has transpired in the area of the Noise in Industry problem in recent years that it is timely to set down for record the salient features of this advance. For many years the harmful effects of industrial noise on hearing have been recognized, but until lately almost nothing has been done about it. With the greater mechanization of industry in recent decades, abetted by the fact that weapons of war are now noisier than ever, increased attention is being paid to the effects of the noise thus created on the hearing of persons exposed to it. This history will attempt to outline the results of this increased attention as spearheaded by the Sub-Committee on Noise in Industry of the American Academy of Ophthalomology and Otolaryngology.

Apparently, the first record of the probable injurious effect of industrial noise on hearing was made by Fosbroke[5] in 1830 when he discussed the hearing loss noted among blacksmiths. Weber[7] commented on hearing loss in boilermakers and railway men in 1862. In the August 4 issue of Lancet in 1866, there was a query by one who signed himself "Volunteer." It read, "Can anyone of your readers suggest a remedy for preventing hearing loss caused by rifle shooting?" The answer, furnished in a later issue, was, "Use cotton in the ears." Barr[1,2], in 1886 and 1890, published rather complete records (for those days) on the injurious effects of loud sounds on hearing. Several reports in the latter part of the nineteenth century testified that railroad workers suffer hearing loss due to noise. Bauer,[3] in 1926, was apparently the first to call attention to airplane noise as a factor in hearing loss. As late as 1935, audiometric studies on hearing loss due to noise were practically nonexistent (Bunch[4]). Kryter[6], in 1950, published a monograph, "The Effects of Noise on Man," which details much of the early history not noted above. It should be read by all who are interested in this subject.

This brief summary of the history of the "Noise in Industry Problem" is the prelude to the recent endeavors of the Committee on the Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology through its Sub-Committee on Noise in Industry. The early activities of the parent committee were centered around prevention of hearing loss following infection in the ears, particularly in children. Nationwide compulsory audiometric examinations and follow-ups of school children were the natural outgrowth of this phase of the Committee's work. In 1946, a Sub-Committee on Noise in Industry was created. This committee had as its first chairman, Dr. W. E. Grove, whose efforts in its behalf were noteworthy. A program was set up which declared that the committee would concern itself with (1) the estab-

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lishment of pre-employment audiograms and follow-up hearing tests as an industrial routine; (2) the advisability of the reduction of noise at its source; (3) the recommendation of the wearing of ear protectors in noisy conditions and (4) research. Two publications followed the announcement of this program. One was a manual written for industrial management outlining procedures which should be used in establishing a conservation of hearing program. The second publication was a statement of the most important facts relative to occupational hearing loss. These are as significant today as when they were written five years ago. They follow:

Fact 1. The deafness caused by loud noise is due to damage to the innermost part of the ear where the nerve of hearing ends.

Fact 2. Such damage is permanent; no method of repairing the delicate structures injured by loud noises is known.

Fact 3. Noise causes more impairment of hearing for high-pitched tones than for low tones, and in the beginning, most or all of the impairment is for tones above the pitch ranges important for the understanding of speech sounds.

Fact 4. The ears of some men are more easily injured by noise than the ears of others.

Fact 5. In recent years, apparatus has become available with which measurements of the ability to hear separate tones from the lowest to the highest can be made quickly and accurately. (Such an apparatus is called a pure tone audiometer; many ear specialists use them.)

Fact 6. In most industrial situations where injuriously loud noises exist, the volume of the noise cannot be reduced to a safe level by any method of "sound conditioning" of walls, machines, etc.

Fact 7. Deafness due to noise can be prevented by reducing to a safe level the loudness of the sounds that actually reach the inner ear.

Fact 8. The wearing of cotton in the ears does not reduce truly injurious noises to a safe level.

Fact 9. Several kinds of ear protectors do reduce injuriously loud sound to a level safe for the inner ear.

Practical Conclusion One:
Utilize Facts 3, 4, 5 and 7, make good pre-employment hearing tests and similar tests at intervals during the first few weeks or months in surroundings with possibly injurious noises, and compare the tests.

Thus, the workmen whose ears are particularly susceptible to injury by noise can be discovered before a serious degree of deafness has been caused. Once discovered, these men can be transferred to jobs in less noisy surroundings or required to use suitable ear protection. For surroundings in which most ears are not injured by the noise present, these simple procedures, routinely used, will suffice to prevent occasional cases of deafness and the resultant claims for compensation.

Practical Conclusion Two:
For jobs in surroundings where it is known or suspected that most or all of the older workmen are hard of hearing due to noise, make good pre-employment hearing tests and periodic tests later and require that good ear protection be used at all times when exposed to loud noises. Thus, in case of claims, factual evidence will be available to use in determining how much damage, if any, has actually occurred to the hearing.

The wearing of ear protectors should be made compulsory during exposure to loud noises of an injurious nature. This is as necessary for the protection of hearing as is the use of safety goggles for the protection of vision.

The response to these documents was slow though they were given reasonable publicity. The attitude of most industrial leaders five years ago was, to say the least, conservative. Few wished to install a conservation of hearing program in the fear that the institution of the necessary procedures would awaken labor to the realization that hearing loss due to industrial noise was a compensable condition. It was clearly a case of "let sleeping dogs lie."

Writing about the need for a national conservation of hearing program, Bunch[4], in 1937, said, "It seems improbable, at the present time, that such a program (pre-employment audiograms and follow-up hearing tests) will be instituted even on a small scale because of the labor and expense involved." It seemed to the Sub-Committee on Noise, a decade later, that Bunch was correct in his prediction.

Then something happened which changed the whole picture. In July 1948, the New York State Court of Appeals decided in favor of the claimant in Slawinski vs. J. H. Williams and Co., and gave him an award of $1,661.25 for a hearing loss caused by industrial noise, while he was still actively working for the company. This was an award made by the final judicial authority in New York State, and it recognized not only that hearing loss due to industrial noise is an occupational disease but that there may be a compensable disability in an occupational disease even without any loss of earnings. This latter inclusion, i.e., a compensation award without loss of earnings, was something new in New York State, and following it there have been many interesting developments.

An almost immediate effect was a flood of claims for hearing loss due to occupational noise. These were most frequent in Wisconsin and New York, and in the latter state now total many hundreds of cases. This led to the realization, on the part of many facets of our economy, that something had to be done and that it should be done soon. Testimony to this is the estimate by insurance officials that the potential accrued liability in the United States represents a possible aggregate award of seven billion dollars. This is a figure which naturally could affect the whole national economy. A subsequent legal action, followed by an administrative fiat, in New York State in 1950 halted the flow of awards and led to the appointment of a medical advisory committee to the New York State Compensation Board. One claimant's case (Grano vs. Despatch Shops, Inc.) was argued and a new defense was interposed; namely, that the degree of permanency of the hearing loss could not be determined while an employee was still working in noise. It was argued that only part of his hearing loss while working was permanent, that the remainder of the loss was due to fatigue, and that the fatigue element could not be ruled out until the worker had separated himself from his working condition for a sufficient time—the length of this waiting period still to be determined. This contention by medical testimony was supported by an impartial specialist employed by the New York State Compensation Board. The referee made an award for permanent loss of hearing in both ears, but this decision was rescinded by the Compensation Board. Subsequently, the Board further ruled that in such cases, the facts should be developed but the referees were not to make awards. They were to send the evidence to the Board itself for decision. This naturally led to the appointment (in 1952) of the Medical Advisory Committee, which made its first recommendations to the New York State Compensation Board in June 1953.

Within the past few months the situation in Wisconsin has changed materially. Prior to this summer the monetary award for loss of hearing caused by industrial noise was as great or greater in Wisconsin than in any other state. Legislation just passed places obstructions in the path of the laborer seeking an award so that few, if any, will receive an award while the legislation stands. The Wisconsin legislature does not meet again until 1955.

The awakened interest in the problem of industrial noise which these legal cases created brought renewed attention to some related problems.

Closely allied to these legal decisions has been the matter of growing dissatisfaction with the current methods of reporting, for medicolegal purposes, the percentage loss of hearing. While there are several of these, the one which has the sanction of the organization with which the greatest number of physicians are associated is the so-called "A.M.A.

method." This is the official method approved by the Council on Physical Medicine and Rehabilitation and its advisory subcommittee on hearing aids and audiometers of the American Medical Association. This method, according to many observers, is weighted too heavily in favor of those whose losses are predominant in the higher frequencies and, in particular, the frequency of 4000 cps. This is the area of greatest hearing loss following exposure to injurious occupational noise. The dissatisfaction reached such proportions that in 1950 a joint committee from the American Medical Association and American Academy of Ophthalmology and Otolaryngology was appointed with nearly equal representation from both societies. This became known, on account of its size and for the sake of brevity (to exclude the frequent use of its parent co-sponsor committee names), as the "Committee of Eight." The meetings of this committee have stretched out over a period of three years, and it is not yet ready with its final answer. One important item of agreement was reached in its October 12, 1952 meeting when it was agreed that any method of reporting loss of hearing for medicolegal purposes should include a test for the ability to hear the spoken voice under controlled conditions. This additional information, when correlated with other standard tests (audiometer, tuning forks, etc.), should provide a better basis for the percentage factor finally determined and be fairer to all concerned than is any of the methods previously used.

Another aspect on the legal side is raised by the question, "What noise is injurious to hearing?" The Academy's Sub-Committee on Noise in Industry had been struggling with the problem of what noise levels might be considered injurious since its appointment in 1946. At a symposium on noise conducted at the May 1952 meeting of the American Acoustical Society, in which a member of the Sub-Committee participated, this unsettled question was mentioned, and subsequently, the Acoustical Society, through its close relation with the American Standards Association, saw to it that a committee of the latter organization was appointed. The duty of this committee is to report its attempts to ascertain what noise may be injurious to hearing and what noise will not. This committee has the formidable title, "The Committee on Bio- and Psycho-Acoustic Criteria for Noise Control" and a formidable task. For over a year, prior to the formation of this committee, many well-qualified investigators had called attention to the fact that the over-all intensity of the noise present in an industrial situation is not the sole factor which should be studied. They admitted that over-all intensities were important, but stressed the fact that analysis of the noise spectrum for predominance of certain frequencies might reveal facts which would also be important in assessing the injurious qualities of a given noise. Their contentions were based on the known clinical fact that workers exposed to noise which has a predominance of the higher frequencies show more hearing loss than workers exposed to noise of equal intensity with predominance of the lower frequencies. This note of warning necessarily has added considerably to the work of the above-mentioned committee, and its recent agendas have attested to this fact. The committee will make a report to the American Standards Association on October 21, 1953. Until the results of further research are available, this report will, of necessity, be in the nature of a preliminary one.

As early as 1948, when there was discussion among the members of the Sub-Committee on Noise in Industry as to possible sources of money with which to carry on the Committee's work, it

was suggested that a national foundation be created. This foundation was envisioned as an organization, neutral in character, to which labor, management, and insurance companies could contribute. With sufficient financial backing, it could correlate all the endeavors in this field and furnish means for research and the collection of all pertinent data to the end that human hearing could be conserved. A communication was prepared by the Sub-Committee outlining such an organization; this was sent to several possible sources of money. While it is interesting to note, historically, that this was done, nothing came of it.

However, in the spring of 1952 a few members of the many contributing organizations of the Industrial Hygiene Foundation (that section of the Mellon Institute in Pittsburgh which is devoted to problems regarding environmental health) raised the question whether or not that organization could act as a coordinating agency in the noise problem. Twenty years ago, an almost similar situation (comparable to the present unsettled state of affairs in the field of noise) existed with respect to silicosis. To find a solution to the chaos then existing, the Industrial Hygiene Foundation was formed. It was created as a central coordinating body to which industrial firms throughout the country were contributing members. Several hundred firms joined in the endeavor. A satisfactory solution to some of the silicosis problems was reached to such an extent that there is today, in industry, no serious silicosis problem. The organization served such a useful purpose that the majority of the individual member firms have continued their membership to the present day. As a result of the above-mentioned inquiries, two conferences were held in the summer of 1952 to which industrialists, safety engineers, physicists, industrial hygienists, lawyers and physicians were invited. As a result of these deliberations, the Industrial Hygiene Foundation agreed to accept the responsibility of guiding and coordinating all endeavors in the field of industrial noise. An initial staff is being assembled, including statisticians, bio-acousticians and secretarial help; work was commenced on February 1, 1953. The entire Sub-Committee on Noise in Industry conferred with the medical director of the Foundation in early January 1953. The future relationship of the Sub-Committee and the Foundation has not been determined.

From a different angle, governmental agencies have been active in the field of noise for a number of years. The Army, Navy and Air Force have been interested in the noise of missiles, aircraft, etc., as their noises affect not only hearing but communications as well. Research and investigation has been going on for some years in each of the branches of the armed forces. A Committee on Hearing of the National Research Council has been the advisory coordinating body for all these activities. The recent agendas of this Committee have been largely devoted to noise problems of governmental agencies. At the last meeting of the Committee, an over-all discussion of the noise problems of the armed forces was conducted. At that meeting, mention was made of the fact that governmental agencies are now employing noise of such intensities that evidence is at hand that more than hearing is affected. It was recommended, at the conclusion of the discussion, that a new and enlarged committee replace the former hearing committee. Consequently, the Armed Forces-National Research Council Committee on Hearing and Bio-acoustics has been formed and had its first Council meeting in March 1953. Undoubtedly, from the activities of this enlarged committee, there will be findings which can usefully be re-

lated to the problem of noise in industry.

During the past several years, other organizations than those already mentioned have been actively interested in the solution of problems created by industrial noise. Three have made significant contributions. First, the American Medical Association, through its Council on Industrial Health, has held three important conferences on the subject. The last of these conferences convened in Atlantic City in 1951 and was attended by many individuals well qualified to assist in resolving some of the problems in this area. Second, the National Noise Abatement Council, whose name divulges its interests, has been active in its field of endeavor, i.e., reduction of industrial noise. For the past few years this organization has sponsored an annual symposium in Chicago at which various aspects of the industrial noise problem have been discussed. Third, the Department of Public Health of the University of Michigan held a conference on "Noise" in 1952 which was important for its informational value.

If there have been other notable contributions during the past five years, lack of mention here is due to oversight and not intent.

In all these activities and interests, the Sub-Committee on Noise in Industry of the Academy has played its part. First, it has carried on its own avowed program, which is directed toward the prevention of deafness caused by noise. The scope of its activities became so great that it was found necessary in 1948 to employ a full-time field representative qualified in the field of audiology. Dr. Douglas Wheeler has been employed by the Committee since that date. He has traveled considerably, aiding industrial firms in establishing conservation of hearing programs, part of which has been the institution of pre-employment audiograms. Over twenty large industrial organizations are now cooperating with the Sub-Committee on Noise, and data from many thousands of employees are available. But this is probably only the beginning. Recently, the Sub-Committee has been offered the opportunity of instituting and supervising a program of testing the hearing of the inmates of the Federal prisons who are exposed to noise. This program will permit follow-ups over succeeding years as there is some limitation to turnover of personnel. A still more significant offer has come to the Sub-Committee from the Navy. The opportunity is the same as the one just mentioned; but in this instance, examinations and follow-ups will be on all civilian personnel exposed to industrial noise who are hired by the Navy. There are 400,000 workers in this program. The resultant study material from these two programs and that which is already in progress is on the clinical research level. To date, the Committee has not been given the opportunity for scientific research in any one plant, but it is a continuing hope that this will be forthcoming. Valuable information, however, is gradually accumulating through annual rechecks in several of the aforementioned plants where the noise levels remain constant, and there is relatively good continuity of personnel.

In Los Angeles, the official home base of the Committee, research in the area of ear defenders has been in progress for the past three years. Advice to industrial organizations on this aspect of the problem has been freely given. Work on predictability tests has been another research problem which has been carried on. A reliable test which would accurately predict those ears which will be especially susceptible to noise and those which will not can be a real boon to conservation of hearing if such tests are simple and can be made part of a routine pre-employment physi-

cal examination. This is a phase of the Committee's work which should have top priority.

There has been a demand for a course of training for nurses and technicians for industrial audiometry. To meet this, a curriculum has been established and courses will be given whenever the demand warrants. Future activities in this regard may be considerable.

Inquiries in the hundreds have been coming to the Los Angeles office. As interest and increased activity is developed, answering these requests will become a growing task. In previous years, the Committee spent much time and endeavor searching for plants where their program might be instituted. Now the situation is reversed, and it is industry which is seeking help.

The individual members of the Sub-Committee have given considerable time, in addition to their contributions to the Committee's work, to the various activities outlined above. For example, on the "Committee of Eight," which is attempting to write a new method for reporting percentage hearing loss, five of the eight members are members of the Sub-Committee on Noise. There is, likewise, representation on the American Standards Association Committee, the Armed Forces Committee on Hearing and Bio-acoustics, and the New York State Medical Advisory Committee. Advice was sought and freely given when the discussions were held which eventually brought the Industrial Hygiene Foundation into this picture.

It has been impossible, in this brief review of the current history of the Noise in Industry problem, to enumerate all the details of the progress made, all the efforts for better organization, all the endeavors to effect better cooperation and all the newer facts which have been learned. The ramifications of the Noise in Industry problem are tremendous. Already jurists, lawyers, industrialists, engineers, acousticians, biologists, physicists, industrial hygienists, insurance executives, as well as physicians are involved. The Sub-Committee on Noise in Industry of the Academy pledges itself to serve any worthy endeavor which is committeed to the solution of some of the problems above outlined. What the next five years will bring forth cannot now be predicted. One can say with confidence that it will be far greater than the advance of the past five years, great as that has been. The amount of human hearing which can be saved is incalcuable.

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REPORT OF THE FIELD REPRESENTATIVE

DOUGLAS E. WHEELER, PH.D.
LOS ANGELES, CALIF.
BY INVITATION

THE purpose of the research undertaken by the Sub-Committee on Noise in Industry is to further the progress of hearing conservation in industry. It became clear in the early life of the Sub-Committee that among the many questions for which answers are necessary there were three which were of prime importance.

Research details were needed concerning (1) how much noise, of what type, for how long, produces how much hearing loss in how many people? (2) Who is susceptible to hearing loss? (3) How can ear protection best be applied?

Obviously, the first question is the large one. Its ramifications have been somewhat outlined for you by Dr. Hoople, and he has also mentioned the other two problems which we have attempted to attack.

Considerable time and effort have necessarily been expended in locating the appropriate areas and locations for the study. It is clear that not all industrial noise need be considered if hearing conservation is the problem. Therefore, choices among industries and, particularly, processes in industry are involved. The types of noises which we have chosen to study include rivetting, drop hammers, welding, molding, furnaces, jet engines, power hammers, planishing hammers, chipping, power plants, compressed air and complex machinery. These represent a general description of types of noises and processes but are not an exclusive list. As new opportunities for research are uncovered, new noise levels and new types of noises may be added to this list.

In the beginning an attempt was made to confine the studies to small numbers, involving men who could, therefore, be studied in considerable detail. This I believe is still a proper approach, but unavoidable difficulties in controlling the situation over a long period of time have made it necessary to expand numbers under study. Sources of supply of data are from men engaged in noisy operations in aircraft plants, municipal services, general industry, military and Federal services and institutions. Data have been collected from 4,500 men and are expected on an additional 14,500. Data from future studies will involve 457,000 men.

I should like to make one particular point which is almost unavoidable even when one studies prison populations—the matter of turnover. It is not amusing when a study is going on in industry to discover after the passage of a year that a good share of the men who have been in the study have gone elsewhere.

In the time available for this presentation it will be impossible to describe all the data which we are collecting; therefore, I shall confine it to two general matters which I think are pertinent to this discussion. For example, one matter of interest is the following question: With what raw material, so

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to speak, does industry begin to conserve hearing? In any given industrial plant what is the status of hearing acuity in the workmen at the time of hiring? This can be studied in cross-section by the pre-employment audiograms.

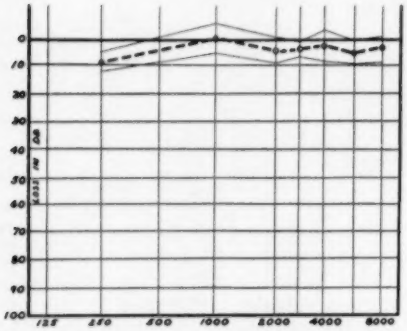

FIG. 1—In one typical large industry, about 75 per cent of the people among some 3,000 workers who are hired during a given period come into the plant with audiograms which are essentially described by the findings in this figure. Figure 1 shows the median value of the hearing loss for 75 per cent of the people studied and the limits which include about the middle 50 per cent. These are statistical tools which we call the median and quartiles, measurements which the statisticians like to use for samples of this type. For us it merely represents what we are now talking about, the audiogram included within the normal range by this method of description.

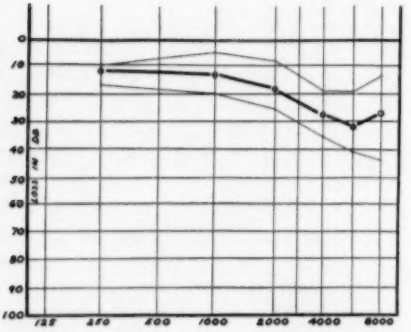

FIG. 2—About 10 per cent of the total audiograms are represented by the general findings on figure 2. Again we see the median as shown by the heavy line, and the outside borders include the middle 50 per cent. The spread, of course, in this type of description is not much greater on either side of the borders.

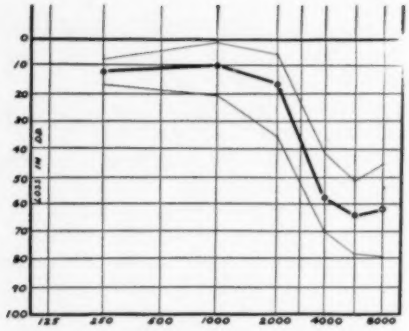

FIG. 3—About 5 per cent of the workers have a more severe audiometric loss as shown by these findings.

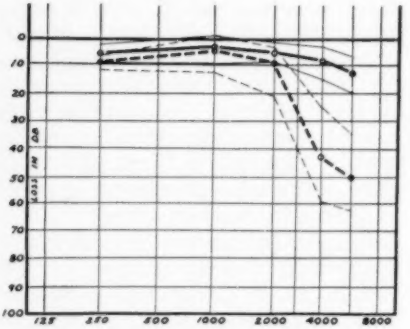

FIG. 4—An additional 5 per cent have asymmetrical losses, meaning that the difference in acuity between the right and the left ear, for example, is not the same, and we have separated them as shown.

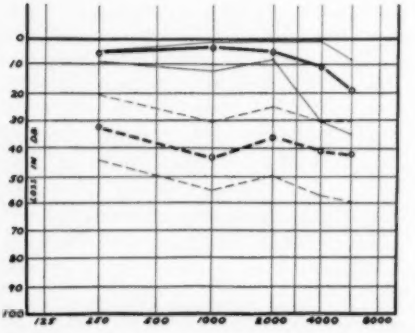

FIG. 5—A final 5 per cent of the total number have somewhat more marked differences.

There is an interpretation of the set of facts presented in figures 1 through 5. It seems to me it should follow these general lines: About one person in four enters this particular industry with some amount of audiometric loss already present. This loss ranges from slight to severe. This does not necessarily attribute the losses found to the particular industry. A man is now being seen for employment and, therefore, his loss may be due to previous employment or, indeed, it may be due to other nonindustrial causes.

One point of view is that there is a pool of some 75 per cent entering industry who are people with normal hearing and whose hearing is, therefore, to be safeguarded. On the other hand, one out of each four individuals already represents some amount of hearing loss, and it hardly needs mentioning that for those people further changes need to be prevented.

This is the matter of conservation in its fullest sense in industry.

Now the next question which, of course, we are vitally interested in is what does happen to people when they are exposed to industrial noise. Study of this question is one of the central activities of the Sub-Committee on Noise in Industry. We show here some findings in a known situation (figs. 6 to 9).

The physical characteristics of noise in one industry are described for you. We divide up the energy into the octave band levels, and determine the relative proportions in each level. This is the matter which Dr. Hoople brought up as bearing upon the importance of knowing the frequency composition of the noise, not just the over-all level. It is interesting that the over-all level of this noise is somewhat greater than 100, but you see that it is essentially an equalized type of disturbance throughout the entire audible range. We know then that in a given situation men are going to work in this noise.

We are particularly interested in this situation because it represents a highly stabilized one in which men work for a long period of time. This is an opportunity, therefore, to say with reasonable confidence that when we examine the hearing of the men who are involved in this study, we know they have been in the presence of this noise and for the lengths of time which are represented by their service time with the company. This is a highly stable situation, one which we wish we could find more frequently in industry and are constantly trying to find wherever possible.

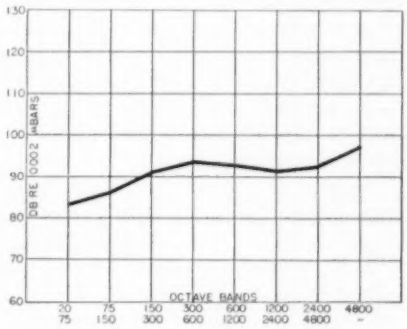

FIG. 6—The physical characteristics of noise.

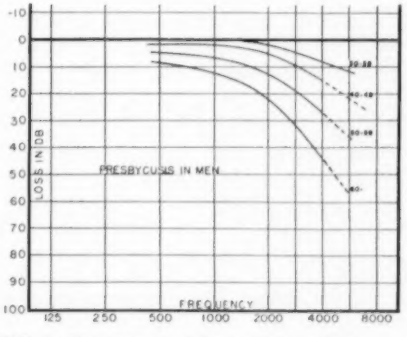

FIG. 7—The increase of hearing loss with age.

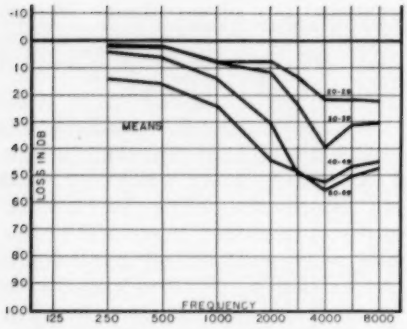

FIG. 8—The increase of hearing loss with age of men working in a noisy environment.

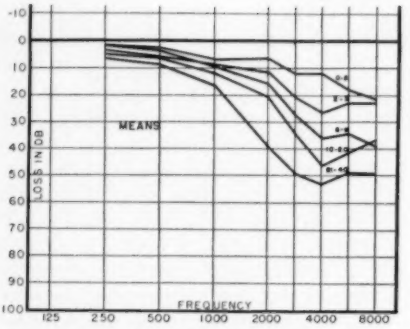

FIG. 9—The increase of hearing loss with age of men in relation to years of service.

Before showing you the audiometric findings I should like to discuss very briefly one factor which must be ever present in our thinking about hearing loss if we are going to attribute it to one cause or another. This factor is none other than presbycusis, which must be reckoned with when we are dealing with men who work for long times and who obviously are increasing in chronological age. We have some information about presbycusis.

The studies as we have them from rather large samples, not made by the Sub-Committee but by previous observations on large numbers of people, tell us that hearing loss increases with age on the average in the population at large as shown by the facts on figure 7. Therefore, as I report the next two sets of findings to you, you will remember that where age is concerned, of course, presbycusis must be considered a factor.

On figure 8 is shown the audiograms by age of men who are, let us say, immersed in the type of noise which was shown to you on figure 7. You see without question that as age increases, if these men continue to work in the same situation, hearing loss also increases.

If we look at figure 9 we see that we have broken down the same results into the length of service time which the men have spent with this company. Obviously, the man who is labeled zero to 2 here is one who has either been very recently employed or who has spent a maximum of only two years, and on the other end of the curve he may have been around for as long as forty years. We can see that there seems to be a fundamental relationship with time, and I may add that this is a greater loss than would be attributed to presbycusis alone.

Now you will, of course, immediately ask what do we know about the nonindustrial causes. These same people were examined otologically and by case history. We have, therefore, the physical findings, and it was perfectly clear from a study of these findings that we were not going to be able to attribute the hearing loss shown here to the more expected nonindustrial causes.

It is not necessary for me then to stress what was so ably presented by Dr. Hoople—the fact that there is a noise problem in industry. These are capsule findings, perhaps, but we are certain that the problem is with us. We are trying to attack it by some of the measures shown.

MEDICOLEGAL ASPECTS

C. STEWART NASH, M.D.
ROCHESTER, N. Y.

IN MAY 1947 a representative of the Liberty Mutual Insurance Company asked me to serve as consulting otologist for his company in the matter of industrial deafness as it presents itself at Dispatch Shops, Incorporated, a subsidiary of the New York Central Railroad and the only concern of its kind making steel freight cars within the State of New York. The representative asserted that within one department of the shop alone, the so-called steel plant, some 300 to 400 men had hearing losses and that all of these employees represented real or potential compensation claims.

Two months later the attorney for the labor union offered me the same job as consultant for the union. Two and one-half million dollars, he declared, was the compensation stake involved in this one room alone. For a period of three years I was the sole otologist for both parties, who apparently seemed confident that my findings and interpretations would be impartial.

In the litigation proceedings the union representatives and I sat together, with the battery of lawyers on the opposite side of the table.

Industrial Deafness Problems and Complications

To all intents and purposes the insurance representative spoke advisedly when he set forth the extent of this problem, for of the men employed in the steel plant for five years or more apparently all do have industrial deafness and all do represent real or potential compensation claims. In this small plant alone nearly 730 men were involved.

Under the labor laws of the State of New York compensation awards had previously been made only if an injury was disabling or caused the employee loss of time from work.

Since industrial deafness is not disabling and does not cause the employee loss of time from work, by statutory enactment, at least, occupational deafness at that time was not considered as a compensable disability. In spite of this fact, however, four or five years later three compensation awards for industrial deafness were made in Buffalo, New York, and a Supreme Court appeal against these decisions was overruled.

Since these rulings altered the entire concept of compensation coverage, the insurance companies and the compensation boards have accepted the validity of industrial deafness as an occupational disease and therefore as a compensable matter.

Noise level and length of service. The over-all noise level in a steel plant is approximately and continuously 115 to 120 db., and 90 per cent of the men so far examined had worked in this atmosphere of noise from ten to thirty years.

Duration of legal phase. The first claim for occupational deafness in this particular plant was in 1946.

Type and degree of deafness. Every claimant whom I have examined has

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shown a nerve deafness in both ears, and no claims so far have been made by any employees who have worked less than five years in a noise level of 115 to 120 db.

The hearing losses are usually about the same in both ears. But when one ear is more affected than the other, right or left, the asymmetry is explained by the position of the employee with respect to the source of the noise.

The approximate losses for speech by the Fletcher point-8 method vary in degree from 20 to 90 per cent in each ear. I have never seen a case of total deafness, even in one ear, occur as the result of occupational deafness as it is observed in the manufacture of steel freight cars.

I should like to call your attention to a very important consideration; namely that occupational deafness must be differentiated from traumatic deafness, which is an entirely different matter.

Methods of Studying the Claimants

Levels of hearing and plateaus. Although the present subject does not lend itself to a recital of the effect of taking histories, making examinations, sending reports, submitting opinions, suffice it to say that the patient undergoes a complete acoustical study, and audiograms made after the employee has had at least five years' exposure to loud noise show certain levels of hearing which we have called plateaus. At designated intervals following the original examination new audiograms show new plateaus. By comparing these plateaus we can determine whether the hearing losses have increased, decreased or remained the same. If the respective plateaus on repeated examination are at the same approximate level we conclude that during the period under observation, and only during the period under observation, the claimant's hearing losses have remained the same. If, however, comparative audiometric plateaus are at different levels, then the claimant's hearing losses have increased or decreased and obviously his occupational deafness for that particular period must be considered as lacking in degree of permanency.

Nerve fatigue and degeneration. Certain patients were examined on Friday, the last working day of the week and again on Monday after two days rest from the steel plant. A significant percentage of these employees showed improved hearing on Monday, as manifested either by a rise in the audiometric plateau or by an increased ability to carry on a two-way conversation in spoken or whispered voice. Obviously, such a degree represents a reversible factor and should not be confused with a basic deafness which is the result of actual acoustic nerve damage or degeneration.

After almost seven years of observing occupational deafness as it occurs in heavy industry, it appears that in a significant percentage of employees permanently removed from many years' exposure to a noise level of 115 to 120 decibels an appreciable degree of improvement in hearing was observed for a period of six months in some employees, for a period of twelve months in others, and in two individuals after an interval of eighteen months.

Statements to the effect that complete recovery ends in forty-eight hours or thirty days or three months were not borne out by my experience. Too often casual observers interpret the initial and greater recovery which comes in the first two or three weeks after removal from the exposure as the total reversible factor. Other observers, however, believe that gains of 10, 15 or 20 per cent may be evidenced six months or more after removal from the noisy environment.

Changing plateaus and compensation. Since final settlements for compensable claims are based on the permanency of the injury, and since audometric plateaus after long periods of apparent fixation have shifted up and down, the insurance companies have taken the attitude that no claim shall be paid until the degree of permanency is established. The claims of 40 men, all of whom I examined on two to four occasions over a period of three and one-half years, are now held in abeyance pending a decision of the compensation commission in regard to the permanency of their deafness.

It is interesting to note that in Rochester, New York, 18 cases were closed without prejudice to the claimants' right to reopen whenever there was evidence to justify reopening. In those cases no award was made, since there was no lost time and no medical proof of permanency.

In one two-day session three years ago I testified in 18 cases. Ten were deferred or settled for reasons of expediency, and 8 claims developed into test cases for determining the method of handling the remainder of the 730 real or potential compensation actions. In all cases the referee made awards based upon hearing losses represented by the audiometric plateaus on my last examination. On the question of permanency, however, the carrier took exception to these awards and appealed the decisions. The Compensation Board, caught in the dilemma of wanting to sustain the referee's awards on the one hand and not wanting to subject itself to justifiable criticism on the other hand, appointed an impartial otologist, the idea being to check technical errors or faulty reasoning or to find the attorneys incorrect in some of their legal and medical assumptions. Fortunately, the impartial otologist verified our audiograms, substantiated our comments, concurred in all of our opinions, and subscribed to all of our theories concerning the development of industrial deafness as it was advanced in the testimony.

Compensation Problems

A. What is the relation of this whole problem of industrial deafness to the industry? With genuine sincerity the management said that if 730 claims for industrial deafness have to be awarded as they come up for hearing, this plant, which is not a large one, will have to close, for it cannot compete with concerns that have no problem of industrial deafness. Perhaps I should explain that the importance of this small plant in the problem of industrial deafness lies not in the size of the plant nor in the number of men employed but rather in its pioneering of compensation claims emanating from such a cause. This relatively small concern was the spearhead of a nation-wide movement to establish industrial deafness as a compensable matter.

One should note that approximately 53 per cent of the average plant census has some degree of occupational deafness. In spite of the general admission that loud noise is the common denominator in all heavy industries, the fact remains that compensation claims for occupational deafness have appeared only sporadically throughout this country.

B. What is the relationship of this whole problem of deafness to the worker? The worker actually sustains an occupational deafness for which he should be and must be compensated.

C. What is the relation of this whole problem of industrial deafness to the compensation board? Apparently the Compensation Commission of the State of New York understands the serious implications of this problem of industrial deafness and is, I believe, considering the following compromises as a means of satisfying all parties con-

cerned and of keeping the industry going and the workers employed:

1. No award shall be made until some period after the claimant is retired or for other reasons leaves the employment of the company.

2. At that designated time the audiometric plateaus obtained will be considered as levels representing permanent losses, provided the claimant shows no evidence of simulating or exaggerating his deafness, and providing some rectification factor can be used for the appraisal of nontraumatic deafness resulting from advancing age.

3. Cash payments will be made promptly when the foregoing conditions are fulfilled.

Symposium: The Problem of Noise in Industry

* * *

THE OTOLARYNGOLOGIST IN THE INDUSTRIAL NOISE PROBLEM

ARAM GLORIG, JR., M.D.
WASHINGTON, D. C.

THE problem of noise in industry and its effect on hearing has added a new responsibility to the work of the otolaryngologist, and particularly the otologist. It is my purpose to enlarge upon this, pointing out some of the many facets of the growing and important role of the otolaryngologist in the industrial noise program.

Conservation of hearing is the ultimate goal of the industrial noise program, and this is, after all, a problem for the physician, primarily for the otolaryngologist.

The role of the physican may be divided into two broad classifications: The first, and in my opinion as a physician the most important, conservation of hearing. The second, and although not as satisfying to the doctor but still very important, evaluation and diagnosis for compensation purposes.

Since the hearing loss produced by noise is the nerve type and not amenable to therapy of any kind, the best cure is prevention; and who should be better prepared to prevent hearing loss than the otolaryngologist.

From the standpoint of conservation *only* in the industrial problem, pure tone air conduction threshold audiometry will suffice. After all, we are not diagnosing. We are establishing a baseline hearing level to which we may refer for follow-up studies.

Threshold audiograms serve this purpose better than screening type tests. Screening tests establish a broad baseline by testing at above normal threshold values. This means, then, that we know only that the hearing is equal to or better than the above-threshold intensity, which is not accurate enough for follow-up purposes in industrial hearing loss. For example, if a person has normal or better than normal hearing, he may lose as much as 15 to 20 db. before his loss is discovered by screening methods. This would be poor conservation, since it is desirable to discover early losses in order to remove

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the worker from the offending environment or make use of ear protection. Then too, if the data is to be used for research purposes, it is necessary to know when small changes of less than 10 db. occur. Such tests should be carried out in as nearly the following manner as is practical in the particular industry: Each new applicant should receive a threshold pure tone test known as a preplacement audiogram, and a second one within thirty to forty-five days after beginning work. Many times on the basis of the findings of the second test susceptible individuals may be discovered because of an inordinate amount of loss, and can be dealt with as best suits the individual case. If no more than the expected loss occurs at the end of the forty-five-day period, the worker should be tested again in six months, and then at six-month to twelve-month intervals routinely, as long as he is in the questionable environment. As far as is possible these tests should be done after a rest period, which should be at least twenty-four hours. This allows for the recovery of the temporary threshold shift which exists in all cases exposed to noise capable of producing hearing loss. The purpose of testing after rest periods is to be certain the threshold has become stabilized.

When testing for purposes of establishing compensation needs the otologist should be prepared to supply all the tests necessary for proper diagnosis, which would include air conduction and bone conduction pure tone audiometry and whatever else the otologist feels is necessary, including tuning fork tests. Because I feel the primary function of the ear is for communication by speech, and because there are difficulties when one tries to validate speech in terms of pure tone audiometry, and because more attorneys, judges, compensation commissioners, etc., can better understand disability when evaluated in terms of language, I feel it is essential that otolaryngologists who intend to do any compensation work should be prepared to do speech tests. I do not intend to infer by this that pure tone audiometry should not be done, but only that speech audiometry should be added to the examination, particularly where compensation cases are concerned. I do not believe this imposes any great difficulty or expense on the otolaryngologist. Speech audiometers are available and have been standardized by the American Medical Association and the American Standards Association. They are not complicated and can be operated without any great amount of technical know-how. They need no different space than is needed for pure tone audiometry.

One of the prime needs for doing proper testing, whether it be by pure tone or speech, is a sound-treated room, unless, of course, the otolaryngologist already has space which is quiet enough for such testing. I recommend that testing rooms should have no more than 50 db. of ambient noise present when measured by the flat scale on a standard sound level meter, or when a normal ear shows no loss in the frequencies below 1000 cycles per second.

In summary, then, I believe the otolaryngologist should be prepared to advise industry concerning the testing needs for hearing conservation, and if he intends to become involved in any compensation cases he should have available good evaluation and diagnostic testing equipment, which includes a sound-treated room and pure tone and speech audiometers.

A STUDY OF THE ROLE OF TOXOPLASMOSIS IN ADULT CHORIORETINITIS

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IN 1952 Helenor Wilder[24] reported finding certain bodies, identical morphologically with Toxoplasma protozoa, in the choroidal lesions of a group of cases which heretofore had been regarded as a typical chorioretinal tuberculosis. This report immediately reopened the moot question: Is a Toxoplasma infection an actual cause of adult chorioretinitis, and if so, how frequently is it a cause?

For years it had been clearly recognized that infantile chorioretinitis might be caused by an *in utero* infection with Toxoplasma. These infants usually presented a more or less characteristic picture with an associated encephalitis, hydrocephalus, mental retardation, other neurologic signs and often cerebral calcification. The Toxoplasma parasites had been found histologically in these retinal and neural lesions.[13] It was also recognized that some children or young adults with histories and retinal scars suggestive of an *in utero* or infantile toxoplasmosis might undergo later exacerbations of chorioditis. Frenkel[6] attributed these later lesions to a possible rupture of a retinal or choroidal pseudocyst with the liberation of the protozoa in sensitized tissue. This view was, however, not fully accepted, being questioned by Sabin.[21] While it was evident that the congenital form of the disease must be an *in utero* infection acquired by placental transmission, nevertheless the infected mother was usually asymptomatic.

Acquired adult toxoplasmosis was not clearly understood. Since the mothers of the Toxoplasma-infected infants were without any stigmas of the disease, it was generally believed that infection in the adult was always asymptomatic. However, in 1940 Pinkerton and Weinman[17] reported a fatal case of adult toxoplasmosis in which the parasite was demonstrated in the tissues post mortem. Since then 4 other similar fatal cases have been reported.[8,15,16,18] Nonfatal symptomatic cases, in which the diagnosis was made by serologic tests have been reported by a number of observers.[1,3,22] The clinical picture in this symptomatic form has been well summarized by Frenkel and Friedlander.[7] The usual symptoms are fever, pneumonitis, hepatitis, lymphadenopathy, often an exanthematous rash, and sometimes signs of a meningoencephalitis. Magnussen[14] and Wising[25] emphasized the resemblance of acute

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toxoplasmosis to infectious mononucleosis. In the recovered or latent stage of the disease the patients showed only the scars or residue of the former infection.

With two exceptions (the cases reported by Magnussen and Wising) none of the reported cases of symptomatic adult toxoplasmosis showed any ocular involvement. It was therefore widely believed that just as the systemic infection was usually asymptomatic in adults their eyes were also immune to Toxoplasma infection the parasite having a peculiar affinity for embryonic or infantile neuroectodermal and ocular tissue.

There were, however, exceptions to this generalization. In 1943, Vail, Strong and Stephenson[23] reported what they believed to be a case of acquired toxoplasmic chorioretinitis in an adult, and in 1946 Johnson and co-workers[12] reported 15 cases of chorioretinitis in which they believed positive neutralization tests pointed to a Toxoplasma etiology. In 1951 Rieger[20] reported 4 cases in adults which he believed were due to acquired toxoplasmosis and emphasized that many cases of perivasculitis retinae and choroiditis juxtapapillaris might be due to this cause. In 1952 he reported 10 additional cases.[19] In 1952 Hogan and his associates[40] in a comprehensive study reported 4 cases in which they believed the evidence of a rising dye test pointed to toxoplasmosis as the cause of an active choroiditis, and in 1953 Duke-Elder and co-workers[4] reported a case in which the histologic examination of an enucleated eye and later serologic studies on the patient all pointed to ocular toxoplasmosis. In a histologic study of 32 eyes with similar lesions these same authors found bodies suggestive of Toxoplasma in the sections but believed they were probably cellular or nuclear debris rather than the parasite.

In their 1952 paper Hogan and his associates[10] reported 338 patients with uveitis studied for evidence of toxoplasmosis. Over 50 per cent of these patients gave positive dye tests, usually of low titers. Approximately 15 per cent gave positive skin tests. Hogan and associates accounted for the low incidence of positive skin tests on the ground that an induration of 10 x 10 mm. was the minimum criterion used by them for a positive test. Complement fixation tests were not done routinely. The incidence of positive dye tests was much greater in the posterior than in the anterior type of uveitis.

In discussing this paper, Feldman[5] pointed out that there is a high incidence of low-titer dye tests in the normal population, and that there is also a high incidence of positive toxoplasmin skin tests. In a series of 144 patients with uveitis and 144 "normal" controls he found almost exactly the same incidence of positive dye tests. Feldman concluded that many people have antibodies for Toxoplasma; and that if acquired adult toxoplasmosis produces chorioretinitis, it must do so with rarity. Last, he pointed out that any significant serologic findings must depend upon changing antibody titers.

In the light of those reports it is obviously necessary to review our ideas on the etiology of granulomatous uveitis and to consider the possible role of toxoplasmosis in the adult disease. In this consideration the first point to be discussed is the value and interpretation of the various serologic tests on which the diagnosis must be based.

THE DIAGNOSTIC TESTS FOR TOXOPLASMOSIS

The Neutralization Test

The neutralization test depends on the ability of an immune Toxoplasma serum to neutralize the Toxoplasma parasite. This is determined by injecting a mixture of serum dilutions and

living Toxoplasma in the shaven back of a normal rabbit. If the serum neutralizes the Toxoplasma, no lesions result and the test is recorded as positive. However, it has been clearly shown that some 10 to 20 per cent of known toxoplasmosis patients lack these neutralizing antibodies and also that such antibodies are present in about 10 per cent of the serums of normal persons[9].

The Toxoplasmin Skin Test

The toxoplasmin skin test depends upon a cutaneous hypersensitivity to the specific protein of the Toxoplasma parasite and is detected by the intracutaneous injection of the specific antigen— toxoplasmin. This test, however, becomes increasingly positive with age. Sabin and Feldman found it positive in 65 per cent of patients over 50 years of age. It is believed to become positive later in the infection, when dye test and complement fixation test fade.

The Sabin-Feldman Dye Test

The Sabin-Feldman dye test is based on the ability of a Toxoplasma-immune serum to inhibit the staining with methylene blue of the cytoplasm of the living Toxoplasma parasite. The test requires an accessory factor present in normal serum. It is a quantitative test, becomes positive early in the infection, rises during the active phases of the disease and fades over the years. Thus it is not only of diagnostic value but also somewhat indicative of the age and duration of the infection.

The Complement Fixation Test

The ability of antibodies in an immune serum to bind complement in the presence of a Toxoplasma antigen is the basis of the complement fixation test. The reaction is usually absent in the early stages of an active infection, becomes positive as the infection progresses, and while it may last for years, disappears more rapidly than the dye test. Thus a developing and increasing complement fixation reaction is interpreted by some to be evidence of a present and active infection.

The Relative Value of the Diagnostic Tests

The neutralization test, with its wide margin of error, is of little value and is not generally used. Main reliance must therefore be placed on the dye test, the complement fixation reaction and the cutaneous sensitivity tests. In both experimental animals and the infected human, the dye test becomes positive early in the disease and increases in titer during the active phases of the disease. The complement fixation becomes positive later, persists for a considerable period and then again becomes negative. It is, therefore, evident that the complement fixation test is of chief value when detected in the stage of development. The toxoplasmin skin test becomes positive only very late in the disease, usually in the latent stage, and the sensitivity persists for years. A positive skin test is little more than an index of a possible former infection. The dye test, therefore, is our chief diagnostic aid.

The dye test is positive in a large number of apparently normal individuals. In a survey of normal populations, Feldman[5] found the dye test positive in 70 of 144 residents of Pittsburgh and in 99 of 121 residents of Tahiti. It was positive in 280 of 682 scattered residents of the United States; most of the positive results were of low titers. Therefore, if the dye test is accepted as specific and indicative of a Toxoplasma infection, it is at once apparent that, at one time or another, a large segment of the normal population becomes infected with this parasite.

It has been argued that the dye test, especially in low titers, may not be specific. However, critics who entertain this opinion are unable to bring sup-

porting evidence for their assertion. Positive reactions with serum from patients with other infections or cross-reactions with other immune serums have not as yet been demonstrated. Therefore, until such evidence is produced, a positive dye test must be regarded as indicative of a present or past Toxoplasma infection.

Since the dye test remains positive in low titers long after the disease is burned out and quiescent, what titers should be considered indicative of an active or recent infection? This question has been investigated in various countries, and in general higher figures in the "normal" population have been obtained in America than in Europe. This difference is probably due to the lack of standardization of the dye test. Beverley and Beattie[2] suggest that differences in the concentration of parasites in the antigen may be the responsible factor for these variations, while Jacobs and Cook[11] suggest that it is related to the strain of the Toxoplasma parasite and the ratio of soluble antigen in the peritoneal exudate to the accessory factor. However, be this as it may, Sabin and his associates state that with their technic, the vast majority of the normal population tested at random show low titers up to 1:64. As a result of their studies of the dye test in 598 normal individuals of various ages, Beverley and Beattie suggest the following figures as significant: under ten years, 1:16 or over; 10-19 years, 1:32 or over; over 20 years, 1:64 or over.

An analysis of the results in the nongranulomatous group and nonuveitis controls reported in this paper, individuals in whom, with two exceptions, there was no possible reason to suspect a Toxoplasma etiology for the disease process, gives the following results:

Under 10 years, 100 per cent below 1:8; 10-19 years, 66 per cent below 1:32, 86 per cent below 1:256; 20-29 years, 66 per cent below 1:64, 91 per cent below 1:256; 30-39 years, 76 per cent below 1:64, 90 per cent below 1:256; 40 to 49 years, 80 per cent below 1:64, 96 per cent below 1:256.

MATERIAL FOR STUDY

For the past ten years an etiologic study of uveitis has been a subject of major investigation in the Wilmer Institute. This study has been predicated on the belief (1) that uveitis can usually be classified clinically as nongranulomatous, or as granulomatous, (2) that nongranulomatous uveitis is a hypersensitive reaction and (3) that granulomatous uveitis is caused by an actual invasion of the uveal tissue by the causative agent in living form.

In the etiologic study, each uveitis patient was subjected to a prolonged diagnostic survey. At the completion of this survey, whenever possible a probable etiologic factor was ascribed to the uveitis. Thus granulomatous uveitis was classified as probably due to tuberculosis, syphilis, brucellosis, sarcoidosis, to a miscellaneous group* and in cases when no clear etiology was apparent, as of "undetermined etiology." As part of the diagnostic survey, blood was taken for various serologic tests and chemical determinations. When the survey had been completed, if there was any blood serum remaining, since 1949 it has been our custom to store such remaining serum in the deep freeze with the idea that at some future time some new test might be developed for which these serums would be useful. When the question of adult acquired ocular toxoplasmosis became acute, these various serums were all resurrected from the deep freeze, the histories of the patients examined and the serums classified according to the clin-

*The miscellaneous group included such conditions as Vogt-Koyanagi syndrome, Bechet's syndrome, lymphogranuloma venereum, Harada's disease, and Herpes.

TABLE I

INCIDENCE OF POSITIVE AND NEGATIVE REACTIONS IN DIFFERENT AGE GROUPS IN CONTROLS, NONGRANULOMATOUS AND GRANULOMATOUS UVEITIS

Type of case	0 to 10 yr.		10 to 19 yr.		20 to 29 yr.		30 to 39 yr.		40 to 49 yr.		Over 50 yr.	
	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.
Controls	6	0	4	3*	12	3*	17	6	15	5	20	7
Nongranulomatous uveitis	2	0	4	0	10	9	26	11	27	4	14	3
Granulomatous uveitis	0	4	6	13	18	12	31	24	28	15	31	19

* One of these positives had optic neuritis and also positive skin tests. See text.

ical picture of the patient. Dye tests were then done on each of these individual serums by Dr. Jacobs. The technic of the dye test was that previously described by Sabin and Feldman in 1948 and 1952. When sufficient serum was available, complement fixation tests were done. Toxoplasmin skin tests had been done on a few patients in 1949, and were done routinely on all patients seen after December 1952.

At the conclusion of the serologic studies, the histories of all cases giving positive dye tests were re-examined and the question of a possible or probable diagnosis of ocular toxoplasmosis was considered in the light of the dye test results, the clinical picture shown by the patient, and the evidence revealed by the previous diagnostic survey.

There were available for this study 110 serums from patients classified as having nongranulomatous uveitis, 201 serums from patients classified as having granulomatous uveitis, and 98 serums from patients who had no uveitis and whose serums had been taken for study for a variety of obscure conditions. This last group was called "non-uveitis controls."

The original classification of the group with granulomatous uveitis, in which any cases of ocular toxoplasmosis would fall, was as follows: ascribed to congenital toxoplasmosis, 10; to tuberculosis, 45; to syphilis, 15; to chronic brucellosis, 14; to sarcoidosis, 13; to "miscellaneous conditions," 26; to "undetermined etiology," 78.

RESULTS

The criteria here used for a "positive" test in the various age groups is as follows: below 10 years, 1:8 or over*; 10 to 19 years, 1:32 or over; over 20 years, 1:64 or over.

*The actual titers of the four positive reactions in the first decade were 1:8, 1:16, 1:64 and 1:512.

TABLE II

CLASSIFICATION	TOTAL NUMBER	POS.	NEG.
Nonuveitis controls	98	24 25%	74 75%
Nongranulomatous uveitis	110	27 25%	83 75%
Granulomatous uveitis	201	87* 45%	114 55%

* Includes 10 cases of recognized congenital toxoplasmosis

Proponents of the theory that toxoplasmosis is a frequent cause of uveitis may argue that these figures are too high, that unless lower titers are regarded as significant, many cases of ocular toxoplasmosis will be overlooked. Disbelievers in a Toxoplasma etiology for adult uveitis may argue that these figures are too low, that a large percentage of the "normal" population show titers of 1:64, and that if titers of this level are regarded as significant, many cases of uveitis will incorrectly be attributed to toxoplasmosis. However, in the present state of knowledge it would appear that titers of these levels in the different age groups are probably indicative of a Toxoplasma infection. Whether the infection is old or recent must be estimated by the clinical picture of activity in the eye and, where possible, by repeated dye tests to detect a changing titer. Thus if titers of this level are interpreted in the light of the clinical picture and other findings revealed by the medical survey, a fair evaluation of the role of toxoplasmosis in adult uveitis can probably be obtained. It is interesting that if the tables presented in this report were based on titers of 1:16, 1:64, and 1:128 in the various age groups, the conclusions drawn therefrom would be the same, although the percentage of positive tests would be somewhat smaller.

The incidence of negative and positive dye tests at different ages in the nonuveitis control group, in the nongranulomatous and the granulomatous uveitis groups is shown in table I. It is apparent that in the control and nongranulomatous groups the incidence of positive tests is statistically the same at various ages. In these groups positive tests were not encountered in the first decade, began to appear in the second decade, reached a peak of about 33 per cent in the third decade and declined to 20 to 25 per cent thereafter. In the granulomatous uveitis group there was a high incidence of positive tests in the first two decades (75 per cent) and thereafter the incidence declined to between 35 and 45 per cent.

Two cases in the nonuveitis control group deserve special mention. These patients were 15 and 25 years of age. Both had a classic picture of optic neuritis. The dye tests in these two patients were respectively 1:256 and 1:1,024. In one of these patients there were no other physical findings. In the second (dye test 1:1,024 and complement fixation ++++) the optic neuritis had followed an acute febrile illness, characterized by enlarged cervical glands, and on the blood picture a diagnosis of infectious mononucleosis had been made. With the recognized affinity of Toxoplasma for neural tissue and the close resemblance of adult symptomatic toxoplasmosis to infectious mononucleosis[14,25], the possibility is immediately suggested that the Toxoplasma infection in these two patients might be related to the optic neuritis, and that the second case might in truth have been

TABLE III

INTENSITY OF DYE TEST TITERS IN CONTROL-NONGRANULOMATOUS UVEITIS GROUPS AND GRANULOMATOUS UVEITIS GROUP

GROUP	NO. OF CASES	NEG.	POS. UNDIL. TO 1:8	1:16 to 1:32	1:64 to 1:128	1:256 to 1:512	Over 1:512
Nonuveitis control + Nongranulomatous uveitis	208	87	45	25	30	12	9
Granulomatous uveitis	201	49	32	38	42	27	13

an instance of adult symptomatic toxoplasmosis. If other cases similar to these two are encountered, our thinking on the etiology of optic neuritis must be revised, and toxoplasmosis considered a possible causative agent.

The consolidated figures of negative and positive tests for all ages in the three groups of patients are shown in table II. The greatly increased incidence of positive tests in the granulomatous uveitis group when compared to the other two groups, a 45 per cent incidence against a 25 per cent incidence, is noteworthy. Not only was the incidence of positive titers greater in the granulomatous group, but the positive serums were also of higher titers (table III). In the combined control-nongranulomatous groups there were 51 serums with titers of 1:64 or over, and only 21 with titers of 1:256 or over. In the slightly smaller group of patients with granulomatous uveitis, there were 82 patients with titers of 1:64 or over and 40 patients with titers of 1:256 or over.

If toxoplasmosis is a cause of adult uveitis, these are exactly the results which would be expected. Clinically, ocular toxoplasmosis is essentially a granulomatous disease, and Wilder's findings indicate that the causative agent is present in the diseased ocular tissues and that the process is characterized by necrosis, tissue destruction and repair by gliosis. In nongranulomatous uveitis (with the exception of some acute late exacerbations in eyes with old granulomatous lesions, commented upon below) there is no reason to suspect that there is any relation between a Toxoplasma infection and the ocular inflammation. Therefore, any positive titers found in the nongranulomatous uveitis patients should be of the same incidence and intensity as in the control group. An increased incidence of positive titers and higher titers should be pres-

TABLE IV

INCIDENCE OF NEGATIVE AND POSITIVE DYE TESTS IN 191 PATIENTS WITH GRANULOMATOUS UVEITIS OF APPARENT OR UNDETERMINED ETIOLOGY

APPARENT ETIOLOGY ORIGINAL CLASSIFICATION	NO.	NEG.	POS.	RECLASSIFICATION OF POSITIVE CASE	
				Original diagnosis sustained	Reclassified as possible ocular toxoplasmosis
Congenital toxoplasmosis	10	0	10	10	0
Tuberculosis	45	32	13	12	1
Syphilis	15	10	5	3	2
Brucellosis	14	8	6	5	1
Sarcoidosis	13	9	4	3	1
Miscellaneous	26	21	5	4	1
Undetermined	78	34	44	2	42
Totals	201	114	87	39	48*

* Plus 10 cases originally diagnosed, total ocular toxoplasmosis, 58.

ent in the group of granulomatous patients, in which ocular toxoplasmosis would fall.

The distribution of the negative and positive titers in the various subgroups of granulomatous uveitis is one of the most interesting findings revealed by this study (table IV). In the 10 cases originally attributed to congenital toxoplasmosis the dye tests were all positive, sustaining the original clinical diagnosis.

In the 113 patients in whom, as a result of the original diagnostic study, the uveitis had been attributed to tuberculosis, syphilis, brucellosis, sarcoidosis or to miscellaneous etiologies, the incidence of positive dye test was 30 per cent, only slightly more than that found in the nonuveitis control and nongranulomatous control groups. When the histories of the 33 positive reactors in these several groups were exhumed and reviewed, 6 cases were found in which the evidence on which the original diagnosis had been based was somewhat tenuous, and in which an equally good case could be made for a Toxoplasma etiology. In the remaining 27 cases a critical review of the histories yielded no valid reason to question the original diagnosis, despite the late finding of a positive dye test. Removing these 6 cases from their previous categories, the incidence of positive dye tests in these various granulomatous uveitis subgroups attributed to conventional etiologies was 23 per cent. This is the same incidence found in the control and nongranulomatous groups. This is probably the margin of error—the incidence of unrelated positives—which must be considered in the interpretation of the dye test.

In the "undetermined etiology" group of 78 patients, where the previous medical survey had revealed no definite etiologic factor to which the uveitis could logically be attributed, the situation was quite different. In this group there were 44 positive dye tests, an incidence of 56 per cent. Furthermore, 8 of the 12 cases with extremely high titers occurred in the granulomatous group, and all 6 cases in which the dye titers rose on repeated tests occurred in this subgroup of undetermined etiology. When the histories of these 44 patients were

again critically examined, in 42 of them a diagnosis of ocular toxoplasmosis offered a plausible explanation for the uveitis.

Thus, in a series of 201 patients with granulomatous uveitis when the results of the dye test were evaluated in relation to the ocular findings and the results of the medical survey, good reason was found to consider a Toxoplasma infection as the incriminated etiologic factor in 58 of these patients—28 per cent of the total. When the age of these 58 patients, any history of juvenile amblyopia and associated suggestive findings were considered, it appeared that in 17 of these patients the Toxoplasma infection was of congenital origin, while in 41 the onset of the ocular disease in adult life, the various Toxoplasma tests and the associated findings all pointed to a late acquired infection. In 10 of the 58 cases of probable toxoplasmosis, the probability of a congenital infection had previously been recognized, but in the 48 newly christened patients, such an etiology had previously not been suspected. In 42 of these latter patients the previous medical survey had been unrevealing and the belated finding of significantly positive dye tests offered the first reasonable explanation for the uveitis. If these findings are accepted as indicative of the etiology of the ocular disease, then in this series the incidence of congenital toxoplasmosis as the etiologic factor is 8 per cent, and of acquired adult toxoplasmosis is 20 per cent.

A brief summary of the re-examination of the histories of the granulomatous uveitis patients giving positive dye tests (excluding the previously recognized 10 cases of congenital toxoplasmosis) is as follows:

Tuberculosis

Thirteen of the 45 patients, originally classified as having tuberculous uveitis gave positive dye tests. In 9 of these patients the titers were 1:64 to 1:128. In 8 of these the evidence in favor of tuberculosis far outweighed the suggestion of Toxoplasma etiology. In the ninth, the evidence for tuberculosis was somewhat tenuous. The patient was 28 years of age, showed glial scars of an old choroiditis in one eye and recurrent vitreous hemorrhages with an area of periphlebitis in the second eye. There was a moderate hypersensitivity to tuberculin, and a few calcified glands in the mediastinum. He responded very slowly and rather poorly to specific antibiotic and chemotherapy. The dye test was positive 1:64 and the complement fixation and skin tests were strongly positive. Obviously, in the light of the previous findings, a good case could be made for a Toxoplasma etiology.

Of the remaining 4 patients, 2 (with dye test titers of 1:256 and 1:512 and good supporting evidence for a diagnosis of ocular tuberculosis) made prompt recoveries on specific antibiotic and chemotherapy, arguing strongly for ocular tuberculosis. The third patient, with good evidence for the diagnosis of ocular tuberculosis, showed a dye test of 1:256, showed no change in the titer on two later tests over a six-month period and had consistently negative complement fixation and skin tests. The last patient, 60 years of age, with a dye test of 1:1,024 and a negative complement fixation test, had what appeared to be a clear-cut generalized tuberculous uveitis of one year's duration, and despite the high dye test the original diagnosis appeared valid.

Syphilis

Five patients with syphilis showed positive dye tests. Two of these patients (with dye tests of 1:64 and 1:1,024) had what appeared to be a diffuse syphilitic choroiditis (Forster). The third, with an original dye test of 1:128, showed a negative dye test one year later. The fourth patient, 37 years of age, with an active "focal" choroiditis had a dye test of 1:64, a negative complement fixation test and ++ skin test. The fifth patient, 48 years of age, with asymptomatic neurosyphilis and retinal periphlebitis with recurrent vitreous hemorrhages had a dye test of 1:64, a weakly positive complement fixation test and +++ skin test. These last 2 patients showed ocular lesions doubtfully attributable to their syphilitic infections, and the actual cause of their ocular disease may well have been the Toxoplasma infection.

Brucellosis

Six patients in the brucellosis subgroup gave positive dye tests. In 4 of these the titer was 1:64, and the 1 patient so tested had a positive toxoplasmin test. Two of these patients had ac-

tive choroiditis and 2 generalized uveitis. In all 4 the history of exposure to brucellosis, positive agglutination tests, and marked hypersensitivity to brucellin and brucellergin pointed more to a Brucella etiology than to toxoplasmosis. The fifth, a 36-year-old farm woman, had a recurrent uveitis of five years' duration, a suggestive history and strongly positive Brucella tests. Almost undoubtedly this patient had chronic brucellosis. She gave a positive dye test of 1:256. The clinical picture pointed more to brucellosis than toxoplasmosis. The sixth patient, also a farm woman, had an acute central focal choroiditis. She gave strongly positive Brucella tests and made a prompt, almost too prompt, recovery on aureomycin therapy. She had an original dye test of 1:1,028, which was repeated three times over one year and remained unchanged. She likewise had a ++++ complement fixation and skin test. Despite the history and positive Brucella tests, the clinical picture and course of the disease probably fit in better with toxoplasmosis than with brucellosis.

Sarcoidosis

Four patients in the sarcoidosis group gave positive dye tests. In 3, with titers of 1:64, 1:64 and 1:128, the ocular picture was typical sarcoidosis and the diagnosis was confirmed by gland biopsy. Obviously, in these patients the positive dye tests should be disregarded. The fourth patient showed the peculiar preretinal nodules so often seen in sarcoidosis. However, there were no other evidences of the disease and a gland biopsy was negative. The dye test was positive 1:256 and was the only other positive finding. A Toxoplasma etiology must be considered as a faint possibility in this case.

Miscellaneous Group

Five patients in this group gave positive dye tests. Two can be immediately disregarded. One of these, with a dye test of 1:64, had a clear-cut metaherpetic keratouveitis. The second, with an original test of 1:128 and titers of 1:64 on two repeat tests, has a classical Vogt-Koyanagi syndrome.

Two of the positive dye test patients had what was believed to be a Histoplasma uveitis. This diagnosis was based on anergy to tuberculin, pulmonary calcification, a violent hypersensitivity to histoplasmin, and an otherwise completely negative survey. The dye tests in these patients were positive 1:64 and 1:128. The possibility of cross-fixation with an anti-Histoplasma serum in these cases appears remote, for there were 5 other similar cases in this "miscellaneous" group, all of which gave negative Toxoplasma tests. It seems probable the positive dye tests in these patients were without significance. The fifth positive patient in this subgroup may possibly be an example of ocular toxoplasmosis. This 42-year-old man presented the confused ocular picture of a generalized uveitis with a secondary inflammatory detachment of the retina. There was a history of recurrent herpes. The medical survey was entirely negative. The possibility of Harada's disease was considered. The dye test was positive 1:512. It is unfortunate that efforts to recapture this patient for further study have been unsuccessful.

Undetermined Etiology

There were 44 positive dye tests in the 78 patients in whom the previous medical survey had revealed no etiologic factors for the uveitis. The distribution of these positive dye tests is shown in table V. Fifteen had low titers of 1:64. Fifteen had moderate titers of 1:128 or 1:256. Eight patients had high titers of 1:512 to 1:16,384. Six had rising titers on repeated tests, the minimum being a rise from 1:64 and 1:512 and the maximum from 1:1,024 and 1:16,384.

Seven of these patients probably had congenital toxoplasmosis. Such a diagnosis had not been suspected on the original examination and study. However, when this possibility was suggested by the belated finding of positive dye tests, it became evident that congenital toxoplasmosis was the probable correct diagnosis. Five of these 7 patients were below 15 years of age. All either had a history of infantile amblyopia in one eye or showed old glial scars in the fundi. In all, the medical survey had been completely negative. All 5 had had recent acute exacerbations, and in 3 the clinical picture fitted well with Frenkel's hypothesis of a pseudocyst rupturing into sensitized tissue. The sixth of these patients was 33 years of age. One eye had been blind since birth, had recently undergone an acute exacerbation, had gone into phthisis and was enucleated. Cultures and animal inoculations of one half of this eye were negative, but most unfortunately, the inoculated animals were sacrificed after three weeks, an insufficient time to establish a negative diagnosis of toxoplasmosis[1]. The histologic diagnosis on the other half was chronic granulomatous uveitis. Repeated dye tests on this patient were positive 1:4,096. Further histologic studies searching for Toxoplasma parasites are now in order. The seventh of the probable cases of congenital toxoplasmosis was a man of 65, blind since infancy. The medical survey in-

TABLE V

DISTRIBUTION OF POSITIVE TITERS IN UNDETERMINED GROUP

TITER	NO. OF CASES	REMARKS
Low Titers (up to 1:64) one result only	15	3 cases of probable congenital toxoplasmosis 6 cases of "focal" choroiditis 1 case of disseminated choroiditis 3 cases of generalized uveitis 1 case of anterior granulomatous uveitis 1 unclassified
Moderate Titers (1:128-1:256) one result only	15	3 cases of probable congenital toxoplasmosis 5 cases of "focal" choroiditis 1 case of disseminated choroiditis 3 cases of generalized uveitis 3 cases of periphlebitis retinae
High Titers (1:512-1:16,324) one result only	8	6 cases of "focal" choroiditis 2 cases of generalized uveitis
Rising Titers on Repeat Test (up to 1:16,384)	6	1 case of probable congenital toxoplasmosis—Late exacerbation at the age of 33 4 cases of "focal" choroiditis 1 case of generalized uveitis

dicated nothing of significance. The fundi showed extensive glial scars. The dye test was positive 1:256.

Twenty-one of the positive dye tests in this undetermined etiology subgroup had what might be called a "focal" choroiditis, with either single or multiple discrete circumscribed exudative lesions or glial scars. Twelve of these patients had titers of from 1:64 to 1:256, 6 had high titers from 1:512 to 1:16,384 on single examinations, and 5 had titers rising as high as 1:16,384 on repeated tests. Complement fixation tests were done on 10 of these 21 patients of which 8 were positive from ++ to ++++ and 2 were negative. Skin tests with toxoplasmin were done in 7 instances and all were positive. All of these patients had focal chorioretinal lesions which, on clinical examination, were quite comparable to the lesions described by Wilder in which she found the Toxoplasma parasite. In the absence of any other discoverable cause, all 21 of these patients must be regarded as probable examples of acquired adult toxoplasmosis.

However, on the evidence at hand the diagnosis of ocular toxoplasmosis cannot be limited to these cases of focal choroiditis. There are 9 cases of generalized granulomatous uveitis and 2 cases of disseminated choroiditis in this group, in which there is equal reason to attribute the choroiditis to toxoplasmosis. These patients had positive dye tests from 1:64 to 1:16,384 and in one the dye test rose from 1:1,024 to 1:16,384 on repeated tests. In 2 of these 11 patients complement fixation and skin tests had been done. All were strongly positive. Moreover, in this undetermined etiology subgroup there were 3 patients with retinal periphlebitis and vitreous hemorrhages. The dye tests were positive—1:128 in 2 instances and 1:256 in the third. None of these 3 patients showed any evidence of tuberculosis. In view of Rieger's[20] previous suggestion that toxoplasmosis is a possible cause of retinal periphlebitis and the 2 such cases already mentioned in this report, a Toxoplasma etiology must be suspected in these 3 cases.

The last 2 of these 44 positive dye tests in the "undetermined" subgroup defy classification. In one the clinical diagnosis lay between nongranulomatous and granulomatous uveitis, being finally classified in the latter group. In this patient the dye test was 1:64 and the complement fixation reaction four plus. The last patient was a veritable jack pot of pathology, the original diagnosis lying between tuberculosis, histoplasmosis and brucellosis, with some evidence in favor of all three. The condition was finally classed as of undetermined etiology. The dye test in this individual was positive 1:64, and toxoplasmosis is therefore entitled to compete with these other conditions for nomination as the etiologic factor.

COMMENT

There are obvious deficiencies in this study. These are (1) the majority of the serums were old, the patients were scattered far and wide and it was impossible to reassemble them for re-evaluation of their condition; (2) contemporaneous complement fixation reactions and skin tests were done on only a very few of the older patients, and not routinely until December 1952; (3) many of the old serums were anticomplementary, and often the quantity of serum available was insufficient for both the dye test and the complement fixation test; (4) repeated dye tests to detect a changing titer were done on only a small number of the positive serums —those examined during the past year when our attention was specifically directed to the question of toxoplasmosis.

However, the age of the serums in no way invalidates the accuracy of the dye tests. The modifying antibody is thermostable, and fortunately the serums were all stored in the deep freeze without a preservative, which would have made them unfit to use. The dye test results are therefore accurate and permit the drawing of valid conclusions. While the value of repeated dye tests and the significance of changing titers is fully admitted, nevertheless it is probable that such a procedure will prove impractical in the majority of the cases. Unsatisfactory as it may be, the average ophthalmologist will usually have to draw his conclusions as to the importance of toxoplasmosis as an etiologic factor in uveitis from a single set of observations. The reason for this is that there are few laboratories where this test is done, the majority of the patients are referred to these central points for consultation and are available for a short period only. While it is practical to send the serums by mail if the blood is sterile and preserved with an antibiotic, but not if tricresol, carbolic acid, etc. are used, for such preservatives kill the Toxoplasma in the test. Therefore the patients on whom repeated dye tests can be done will probably be limited to those who live in close proximity to the central laboratories.

Despite these obvious defects, this study gives a good picture of the role of a Toxoplasma infection in granulomatous uveitis, *provided two cardinal premises are accepted.* The cardinal premises are:

1. The bodies found by Wilder in the chorioretinal lesions are true Toxoplasma parasites and are the actual cause of the chorioretinal lesions.

2. The dye test in the dilutions here regarded as signficant is specific for toxoplasmosis, and that positive tests are indicative of a present active or of an old latent infection.

As concerns the first premise, it is almost universally admitted that the bodies described by Wilder are morphologically identical with Toxoplasma, and if their identity is so admitted, they are in all probability the actual cause of the lesions. Nevertheless, there remains the possibility they may be artifacts, nuclear or cellular débris. Until such time when Toxoplasma organisms are recovered from an enucleated eye by animal inoculation and their living nature proven, the possibility of these bodies being artifacts remains.

As concerns the second point, there is no present evidence that the dye test is not specific. It is positive regularly in experimental animals and known infected infants, and positive tests of any significant degree have not been found in other protozoan or yeast infections. Until the time evidence to the contrary is presented, the dye test must be accepted as specific for a Toxoplasma infection.

Based on these two premises, and subject to fallacy if these premises later

are proven erroneous, the statistical studies presented in this report justify the following broad conclusions and comment.

A. Toxoplasmosis in the adult is a widespread and extremely common infection. As a general rule the infected individuals are entirely asymptomatic. Only an occasional infected adult shows any systemic evidence of infection. The eyes, however, appear definitely more susceptible to symptomatic toxoplasmosis than do the other tissues of the body. This may be due either to special affinity of the parasite for ocular tissues or to the fact that when minute lesions occur in the eye, they produce physiologic changes out of all proportion to the size of the lesions. Thus lesions, which in the viscera would cause no symptoms, would pass unnoticed and be impossible of detection, assume major importance when they occur in the eye.

B. A clinical diagnosis of ocular toxoplasmosis is only justified when the following three criteria are fulfilled.

1. The eyes show either the glial scars of old granulomatous lesions or active granulomatous uveal lesions, or possibly a periphlebitic retina.

2. A careful medical survey has revealed no evidence of other granulomatous disease to which the ocular lesions may logically be attributed. Should any given patient with a granulomatous uveitis show evidence of another systemic granulomatous disease and at the same time show positive tests for toxoplasmosis, the question then is one of differential diagnosis. In the series here reported this dilemma was encountered 33 times in 113 cases of granulomatous uveitis (table IV). Yet when each history was critically re-examined and all factors, including the positive dye tests, were carefully weighed, in only 6 instances did there seem reason to question the original diagnosis which attributed the ocular disease to recognized conventional etiologies. In the main, the differential diagnosis should not be too difficult. It is of more than passing interest that positive dye tests were encountered in 44 of 78 cases where no conventional etiology was suggested by the medical survey and that in 42 of these, the positive Toxoplasma tests appeared to give the true answer.

3. The patient gives serologic or cutaneous reactions indicative of a Toxoplasma infection. The dye test must always be positive, the complement fixation and skin tests may be either positive or negative.

In this series, the number of serums from patients who had simultaneous dye, complement fixation, and skin tests was insufficient to permit any specific conclusions on the diagnostic significance of various combinations of positive and negative results with these three tests. A survey of the material available indicates that in old, quiescent cases of probable ocular toxoplasmosis the dye test was usually of moderate titer (1:64 to 1:256). The complement fixation test was usually positive, but occasionally was negative. The skin test was usually positive. In active cases, especially those of some duration, the dye test tended to be high (1:512 or over), the complement fixation test was either positive or negative, and more often than not, the skin test was negative. The most important indications for a Toxoplasma etiology in a granulomatous uveitis are undoubtedly either a very high titer dye test, a dye test titer which rises on repeated examinations, or a complement fixation, originally negative, which becomes positive during the course of the disease. These observations appear to be in line with those of other students in this field.

It is an incorrect syllogism, however, that a high titer dye test may always be interpreted as positive evidence of

a Toxoplasma etiology in granulomatous uveitis. While the dye test tends to be high in the active stages of the disease; nevertheless, high titers of 1:512 to 1:2,056 were occasionally encountered in individuals in whom there was no question of ocular toxoplasmosis. In this series, 9 such high titers were encountered in the 208 individuals in the nonuveitis control and the nongranulomatous uveitis groups.

Accepting the conclusion that previous investigations and the material presented in the report support the idea that an acquired Toxoplasma infection may produce adult ocular disease, what are the clinical ocular pictures under which the disease may parade?

The most frequent lesion in the cases here classed as ocular toxoplasmosis is undoubtedly a "focal" choroiditis. In the undetermined etiology subgroup there were 21 patients with such chorioretinal lesions. When all the various other subgroups of granulomatous uveitis were surveyed, there were 22 other cases of "focal" choroiditis with positive dye tests in whom the diagnosis of ocular toxoplasmosis appeared justified. Thus of the 58 patients in the entire granulomatous uveitis group in whom a Toxoplasma infection appeared to be the probable cause of the disease, 43 had what is often called "focal" choroiditis, either manfested by discrete pigmented glial scars or by circumscribed exudative lesions. Yet, it would be grossly incorrect to attribute all cases of focal choroiditis to toxoplasmosis. While in this series 43 cases of focal choroiditis are finally attributed to toxoplasmosis, there are also 32 other cases of typical "focal" choroiditis in which the Toxoplasma dye tests were negative. From the clinical viewpoint, a focal choroidal lesion is suggestive but far from indicative of a Toxoplasma etiology.

There were 10 cases of generalized granulomatous uveitis and 5 cases of retinal periphlebitis with secondary vitreous hemorrhages in the 58 cases attributed to a Toxoplasma etiology. In all of these there was equal reason to incriminate toxoplasmosis. Also to be remembered are the 2 cases of straight optic neuritis in the control-nonuveitis series, both of which might well be of Toxoplasma etiology.

One other clinical picture must be mentioned. In the 17 cases in which either an early or late diagnosis of congenital ocular toxoplasmosis had been made, there were 3 cases which presented a peculiar picture. These patients all had a history of infantile or juvenile amblyopia in the affected eye, heavy discrete glial scars of an old choroiditis, positive dye tests, and negative medical surveys. All had late acute exacerbations, characterized by diffuse subretinal edema, blurring of the vitreous and loss of fundus details. The attacks ran a short course and subsided with extensive retinal degeneration. The general picture was that of an acute nongranulomatous reaction superimposed on an old granulomatous process. Frenkel's suggestion that such lesions are caused by the rupture of a pseudocyst in sensitized tissue offers a logical explanation for the picture.

In summary, judging from the evidence in this series, ocular toxoplasmosis may appear in various guises. The most frequent is the picture of focal choroiditis; next that of a generalized granulomatous uveitis. Retinal periphlebitis with secondary vitreous hemorrhages may occasionally be due to toxoplasmosis, as may acute nongranulomatous inflammations of the posterior uvea in patients who show evidences of old granulomatous fundus disease. There is a possibility that some cases of optic neuritis may also be due to a Toxoplasma etiology.

One further technical point deserves comment: whether or not a toxoplasmin skin test would in itself produce any change in the titer of the dye test. It has long been known that skin tests with brucellin or brucellergin may profoundly alter the titer of subsequent Brucella agglutination tests. It was, therefore, within the realm of possibility that some such alteration might be produced by the toxoplasmin test. To investigate this point, in a number of patients, blood was drawn for the dye test prior to the toxoplasmin test, and again five days after the test. The titers of the pre-toxoplasmin and post-toxoplasmin tests were always the same. It seems clear, therefore, that toxoplasmin tests may be done in a patient without fear of affecting the future reliability of the dye test.

SUMMARY

This investigation was undertaken to determine whether a dye test study of the serums of a large number of well-studied and classified cases of nongranulomatous and granulomatous uveitis patients would shed any light on the highly controversial question of the existence of adult acquired ocular toxoplasmosis as a clinical entity. The study has yielded considerable circumstantial evidence that this is true and that a Toxoplasma etiology can reasonably be ascribed to a large percentage of granulomatous uveitis cases—in this series 58 out of a total of 201 cases. Seventeen of these cases were probably congenitally acquired infections and 41 were probably due to adult infections. The circumstantial evidence deduced from this study may be summarized as follows:

1. In the nonuveitis control group and nongranulomatous uveitis group, where there is no thought of a Toxoplasma infection being related to any ocular disease, there is about a 25 per cent incidence of positive dye test.

2. In the granulomatous uveitis group, in which any possible Toxoplasma ocular disease would fall, there was a statistically significantly higher percentage of dye tests; 45 per cent.

3. In the granulomatous uveitis group these positive dye tests were generally higher than in the other group. Furthermore, all cases of rising titer on repeated tests were encountered in the granulomatous group of patients.

4. A study of the distribution of these positive dye tests in the various etiologic subgroups, a classification determined as a result of a previous thorough medical survey of each individual patient, showed the following: The incidence of positive tests in the subgroups attributed to recognized conventional etiologies was essentially the same as in the control group and in nongranulomatous uveitis patients; around 25 per cent. The greatest number of positive tests occurred in the group of "undetermined etiology," where the previous medical survey had failed to reveal any etiologic factor to which the ocular disease could logically be attributed. The incidence of positive dye tests in this group was 56 per cent.

5. A critical review of the histories of patients with granulomatous uveitis who showed a positive dye test gave the following information. In the various subgroups previously attributed to conventional etiologies, there were 6 cases in which a fair case could be made for a Toxoplasma etiology instead of the original granulomatous disease to which the disease had been attributed. In the remaining 27 cases, previously attributed to conventional causes, no reason was found to alter the original etiologic diagnosis.

In the subgroup in which no etiologic factor had previously been determined there were 44 patients with positive dye tests. In 42 of these a Toxoplasma infection offered a reasonable explanation for the uveitis.

6. An over-all view of the probable or possible Toxoplasma etiology in the granulomatous uveitis cases showed that the incidence of such probable or possible etiology was approximately 28 per cent, 58 in 201 such patients.

7. The most frequent ocular lesions in these patients where the ocular disease was attributed to a Toxoplasma etiology was a so-called "focal" choroiditis. There were, however, an appreciable number of cases of generalized granulomatous uveitis and retinal periphlebitis to which, with equal justification a Toxoplasma etiology could be attributed. There were 2 cases of straight optic neuritis in which such an etiology could be suspected.

8. The cases of active uveitis attributed to toxoplasmosis frequently showed high dye test titers, and in cases where the dye test was repeated, consistently showed rising titers. The occurrence of positive complement fixation reaction and positive skin tests was sometimes variable. For technical reasons, it is doubtful if repeated dye tests will be a practical procedure in the average patient.

Subject to fallacies in the two accepted premises, e.g., that the bodies found by Helenor Wilder in chorioretinitis cases are true Toxoplasma parasites and that the titers used here for a positive dye test are a reliable specific indication of a Toxoplasma infection, this study permits the following conclusions:

CONCLUSIONS

1. Adult acquired ocular toxoplasmosis is an actual clinical entity.

2. A Toxoplasma infection is the probable etiologic factor in approximately 25 per cent of adult granulomatous uveal disease.

3. The diagnosis of a Toxoplasma etiology can only be made by a careful consideration of the clinical ocular picture, an evaluation of the results of a careful medical survey, and the results of the serologic and cutaneous Toxoplasma tests.

4. In the evaluation of a single positive dye test as an index of a Toxoplasma etiology, there appears to be a 20 to 25 per cent margin of error.

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DISCUSSION

MICHAEL J. HOGAN, M.D., San Francisco, Calif.: Dr. Woods and his co-workers have provided us with an excellent analysis of their findings with regard to toxoplasmosis in 311 cases of uveitis and in 98 nonuveitis controls. This is the first attempt to evaluate the serologic findings in granulomatous and nongranulomatous uveitis, and it is fortunate that Dr. Woods had the foresight to save serums from his many cases of uveitis.

The report emphasizes the importance of understanding the reliability of the various serologic tests for toxoplasmosis. It is not always feasible to isolate specific organisms which cause individual cases of uveitis. We must, therefore, rely on laboratory tests, which in turn depend on certain principles before they can be properly interpreted. A fair number of papers have been published on ocular toxoplasmosis based on the results of methylene blue dye test titers. The diagnosis, in many instances, has been based on inadequate serologic evidence. Since dye test antibodies for toxoplasmosis exist in a titer of over 1:16 in approximately 30 to 40 per cent of the normal adult human population, it is obvious that single positive determinations are of very limited value. It is only in cases where different serum samples are examined simultaneously and there is a difference of two tubes in the determination that we can state with some certainty that the serologic evidence is of value. In addition to the laboratory findings, the authors have rightly stressed that the clinical findings and history are of extreme importance.

Almost one third of the 58 patients with granulomatous uveitis having positive serologic tests were considered possibly to be of con-

TABLE I

CHORIORETINITIS AND IRIDOCYCLITIS

Combined results of methylene blue dye tests in all cases of granulomatous and nongranulomatous uveitis

CASES, NO.	GRAN			NONGRAN			TOTAL POS.	
	TOTAL	NO. POS.	%	TOTAL	NO. POS.	%	NO.	%
457	141	51	35	316	68	21	119	25

TABLE II

IRIDOCYCLITIS

CASES, NO.	GRAN			NONGRAN			TOTAL POS.	
	TOTAL	NO. POS.	%	TOTAL	NO. POS.	%	NO.	%
299	65	18	27	234	40	17	58	20

TABLE III

CHORIORETINITIS

CASES, NO.	GRAN			NONGRAN			TOTAL POS.	
	TOTAL	NO. POS.	%	TOTAL	NO. POS.	%	NO.	%
158	76	33	47	82	28	33	61	40

genital origin. We have made similar observations and, in a previous report, suggested the possibility that a congenital infection may lead to later inflammatory exacerbations in the eyes.

Positive tests were found in 13 of 45 patients with probable ocular tuberculosis. Four of these cases obtained a good response to antituberculosis drugs and, as a result, were not considered to have ocular toxoplasmic lesions. This observation is of importance because it indicates the value of therapeutic studies in doubtful cases.

This series of cases provides evidence that the incidence of positive tests in patients with nongranulomatous uveitis is the same as that found in the 78 patients in the normal control group. The titers and incidence of positive tests were greater in the granulomatous than in the other two groups. We have summarized the findings in 457 of our own cases for comparison with the present series (table 1). It is seen that the incidence of positive tests is higher in the granulomatous than the nongranulomatous forms of uveitis. I should mention that all types of endogenous uveitis are included in this series. For further study, the series is broken down into those with iridocyclitis and those with chorioretinitis (tables II and III). The incidence of positive tests is higher in the group with granulomatous chorioretinitis.

During this past winter, we selected 11 cases of extensive acute chorioretinitis involving a sector of the fundus and, possibly, of toxoplasmic etiology. All clinical and serologic studies were negative in this group. None of these cases responded to antituberculosis drugs or to daraprim and sulfadiazine. This study was undertaken to determine if the latter combination might be effective against suspected toxoplasmic lesions. The difficulty of establishing a positive diagnosis of toxoplasmosis was brought out by these cases. Frenkel

has stated that the amount of antigen liberated by foci of choroiditis into the general circulation is small and probably is insufficient to cause a change in the serum antibodies.

The 78 cases in the "undetermined etiology" group provide a great deal of interest. Fourteen of these cases had extremely high titers and, of these, 6 cases showed a rising titer on repeated testing. One must consider them as extremely probable cases of acquired ocular toxoplasmosis.

It remains to be seen whether toxoplasmosis of the acquired acute type in adults is accompanied by ocular lesions. Very few examples of ocular toxoplasmosis have been reported during acute systemic toxoplasmosis, but it is suspected that few clinicians studying such cases have made thorough examinations of the fundi.

The authors' comment that the 43 patients with focal choroiditis had positive dye tests again emphasizes the fact that there is no characteristic lesion of toxoplasmosis. I agree, however, that large acute foci of choroiditis are suggestive.

I wish to thank the authors for the privilege of discussing this most informative paper.

NORMAN ASHTON, London, England: I greatly appreciate the honor of being invited to speak at this Academy meeting and I am particularly privileged in being selected to discuss the important paper of Dr. Woods and his colleagues. It is clear that a great deal of thought has been devoted to this study and the authors are to be congratulated on the lucid analysis of their data.

In Great Britain there is also a lively interest in the problem of Toxoplasma infection and, as in America, Wilder's report[24] has stimulated an even closer scrutiny of clinical and laboratory findings in an attempt to assess the signficance of this parasite in the etiology of adult uveitis.

The serologic surveys carried out in England are in complete agreement with those in America in that the incidence of positive results appears to imply that toxoplasmosis is a widespread and common disease for most workers believe that the antibodies represent a response to an actual subclinical infection.

We still have no certain knowledge, however, as to how the disease may be transmitted, but whatever the exact mode of origin of the widespread antibodies in the normal population, the problem of serologic diagnosis is of the same order as that of enteric infections in an inoculated community, where no arbitrary titer of agglutination can be entirely acceptable as diagnostic of active infection. While agglutination in high titers provides presumptive evidence of infection, it is a rising titer on repeated examination which is of greater diagnostic importance and, as Dr. Woods emphasized, the same applies in toxoplasmosis. Continuing the analogy, however, it will be remembered that the titer of the "H" agglutinin may rise considerably as a result of an unrelated pyrexial infection but, as far as I am aware, there is no evidence to show that Toxoplasma antibodies may be similarly stimulated nonspecifically, although Frenkel[6] has advocated the use of nonspecific protein therapy in toxoplasmic uveitis in order to increase the shedding of antibody into the blood stream.

On *a priori* grounds it is unlikely that an "O" antibody would be boosted to any important extent by such nonspecific stimuli, but it is nevertheless essential to know whether this may occur in toxoplasmosis before placing too much emphasis on serologic findings alone.

It was, therefore, of particular interest to learn that some of Dr. Woods' cases, although showing significantly high Toxoplasma titers, had evidence of other infections—a group which he calls "unrelated positives." In the brucellosis cases, for instance, the question arises as to whether the high Toxoplasma titers could have been the result of a nonspecific stimulation from the Brucella infection, and a similar interpretation might be applied to the case of tuberculous uveitis with a high positive titer for toxoplasmosis in the dye test.

In this connection the recent report of Hein (Ztschr. f. Tropenmed. u. Parasitol., 3:339-357, 1952) is interesting. In 102 cases of pulmonary tuberculosis he found that 57.8 per cent reacted positively to the dye test for toxoplasmosis, an incidence much higher than that reported for the "normal" German population. There are, of course, many factors to be taken into consideration in interpreting these findings, such as a common exposure or susceptibility to the two infections, but they may lend some support to the concept of nonspecific stimulation of Toxoplasma antibodies.

The picture is further complicated by the fact that the titer of Toxoplasma antibodies may fall quite rapidly, so that insignificant titer levels not only fail to exclude the disease, but do not even render it improbable. In a case to be reported by Hudson (1953) the dye test titers fell from 1:800 to 1:80 in five months and similar rapid falls to low titers have been reported by Hogan and others[10].

At the Institute of Ophthalmology, London, we are investigating the incidence of positive Toxoplasma serology in cases of chorioretinitis of undetermined etiology; in patients less than 20 years old with old focal chorioretinitis we obtained the following figures in the dye tests carried out by Professor Beattie and Dr. Beverley[2] of Sheffield University:

GROUP	POSITIVE, PER CENT	SIGNIFICANT POSITIVE TITERS, PER CENT	INSIGNIFICANT POSITIVE TITERS, PER CENT
Control (44)	15.9	6.8	9.1
Patients (39)	58.9	38.4	20.5

Dye tests for toxoplasmosis. Incidence of positive results in a group of patients less than 20 years old with healed chorioretinitis compared with a control group of normal people of the same age group.

It will be seen that there is a greater incidence of positive and of significant positive titers in the patient group, confirming the importance of toxoplasmosis in the etiology of congenital chorioretinitis, but it is of particular interest to note that this higher incidence is also reflected in the figures which would be regarded as insignificant in an isolated case. It may be, therefore, that in serologic surveys one should not neglect the distribution of low positive titers.

As Dr. Woods has pointed out, the titer levels of the dye test are lower in the "normal" population in Europe as compared with those obtained in America. Nor does the antibody titer in cases of active infection rise to the high levels reported in America—figures of over 1:2,000 being quite exceptional. In Great Britain the organism originally isolated by Sabin from a boy of 8 with meningitis, is used in the dye test so that the differences in titer levels may well result from antigenic differences in the strain of the infecting organism. It was, therefore, instructive to hear that Drs. Jacobs and Cook believe this to be at least part of the explanation. Since strain variations are not infrequently accompanied by differences in pathogenicity, it is necessary to be guarded in comparing data obtained in different countries; indeed toxoplasmosis may be a more important etiologic factor in uveitis in America than in Europe.

It was interesting to hear that Dr. Woods and his colleagues found that the incidence of positive results in the control and nongranulomatous uveitis cases were identical and this, as they have said, does very strongly suggest that toxoplasmosis probably plays no part in nongranulomatous chorioretinitis. It would also have been valuable to know their findings in anterior uveitis, for Frenkel[6] and Hogan and others[10] reported a higher incidence of positive serums in patients with posterior than in those with anterior uveitis. Dye tests performed on 95 adult cases of active anterior uveitis in London gave positive results in 62 per cent, which is higher than the incidence reported by Beverley and Beattie[2] for the "normal" adult population (26 per cent), but of this series only 3 cases showed titers above the "normal" range. We are inclined to believe, therefore, that toxoplasmosis probably plays little part in pure anterior uveitis, and we suppose that the predominance of Toxoplasma lesions in the posterior fundus may be due to the predilection of the organism for the nervous tissues of the retina.

With regard to the specificity of the Toxoplasma dye tests, it is true that there is as yet no evidence that cross-reactions may lead to confusion, but the recent report of Mühlpfordt (Ztschr. f. Tropenmed. u. Parasitol., 3:205-215, 1951) that infection with sarcosporidiosis in guinea pigs, rabbits, sheep and pigs results in a positive reaction to the dye test for toxoplasmosis, casts some doubt on the specificity of the test and justifies the cautious reservations which Dr. Woods and his colleagues have made to their conclusions.

On the other hand Professor Beattie and Dr. Beverley have told me in a personal communication that they have examined the serum from a human case of sarcosporidiosis and the results were completely negative for toxoplasmosis both in the complement fixation and dye tests. Furthermore, the serums of 170 abattoir workers did not differ serologically from the normal population.

Histologic examination of cases of uveitis in my department are in agreement with Wilder[24] that typical Toxoplasma crescents may be found in adult chorioretinitis of the focal granulomatous type, and the complete clinical picture of one of our cases showed that active ocular toxoplasmosis in adult life is undoubtedly a clinical entity. In cases of diffuse granulomatous uveitis, however, we have not found perfectly typical forms, but in some of our cases, where a diagnosis of toxoplasmosis was highly improbable, structures resembling crescents and pseudocysts were demonstrated. There appears to be a danger of confusing cellular debris or nu-

clear fragments with some stages of the protozoa, and unless quite typical crescents are found, it is impossible to differentiate the one from the other.

In summary, therefore, it may be said that histologic appearances taken alone are necessarily doubtful, that it is not known whether Toxoplasma antibodies may be nonspecifically stimulated, that the specificity of the antibodies is still not completely decided and that pathogenicity may vary between strains of Toxoplasma. I feel, therefore, that until these questions are clarified, especially by the isolation of Toxoplasma in cultures of uveal tissue, the time has not yet arrived when the exact role of toxoplasmosis in uveitis may be accurately estimated, but the valuable contribution of Dr. Woods and his colleagues, with its emphasis on the need to interpret the serology in terms of the clinical picture, carries us very much nearer the final elucidation of the problem.

SEROLOGIC DATA ON ADULTS WITH HISTOLOGICALLY DIAGNOSED TOXOPLASMIC CHORIORETINITIS

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CHORIORETINOPATHY is a predominant finding in congenital toxoplasmosis. Feldman,[3] for instance, records its occurrence in about 99 per cent of neonatal cases of the infection. However, the precise role of toxoplasmosis in the etiology of disease of the uveal tract in adults is not as easily discernible, at least by present clinical and laboratory methods. Frenkel[4] showed some correlation between skin test reactions and uveitis in a group of hospital patients in California. On the other hand, Feldman[3] states that he found positive dye test titers in only 18 per cent of 140 patients with chorioretinitis, and he concludes that "if *acquired* toxoplasmosis ever produces eye disease, it must do so with great rarity." Hogan[6] in summarizing his analysis of dye test results on 37 cases of nongranulomatous iridocyclitis, granulomatous iridocyclitis, and chorioretinitis, concludes that "the dye test furnishes no information in this group as to the cause of uveitis by Toxoplasma." In a later paper, Hogan, Thygeson, and Kimura[7] found the incidence of positive dye test reactions higher in all age groups with chorioretinitis than in other samples, but they were at a loss to correlate the low titers they obtained with the current eye disease.

The results of a large survey of cases of uveitis reported by Dr. Alan Woods and his associates at this meeting, differ from those of Feldman. According to this study, there is a significantly higher incidence of positive serologic reactions among individuals with granulomatous uveitis unassociated with any evidence of other possible etiology, than among individuals with nongranulomatous uveitis or with no eye disease. The essential feature of the analysis is that an attempt has been made to rule out of consideration other etiologies of uveitis, so that the group with eye disease of possible toxoplasmic origin becomes smaller and less likely to contain cases which cloud the statistical treatment of the data. It is of interest to note that even if cases classified clinically as tuberculous in origin are included in the group of unknown etiology, this group still shows a significantly higher percentage of dye test positives than the controls. The results are analyzed on the basis of a classification of the significance of titers in relation to age (Beverley and Beattie[1]), which it is believed throws out of consideration some low titers which generally are taken as specific evidence of past or latent infection.

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However, even though this comprehensive study does afford evidence correlating Toxoplasma infection with eye disease in adults, again the question of generally low dye test titers confronts us.

The most definite evidence of the toxoplasmic origin of uveitis thus far available is the demonstration by Wilder[15] of protozoa in chorioretinal lesions of cases in the Registry of Ophthalmic Pathology most of which were originally considered "probable tuberculosis" on a pathologic basis. The resemblance of these parasites to Toxoplasma is beyond question. However, it must be pointed out that other organisms of similar appearance do exist, and the identification of Toxoplasma should be made on the basis of biologic and immunologic as well as morphologic characteristics. Another fundamental question is the relationship, in time, of the original infection to the uveitis; it has been conjectured by some workers that the localization of the parasites in the eye is the result of congenital infection, of which the uveitis is a late manifestation.

In the hope of providing further information on these questions, an attempt has been made to obtain and test serum specimens from individuals in whose eye lesions protozoa were demonstrated on pathologic examination. Thus far, it has been possible to obtain specimens from 21 such cases. These have been tested by the dye test of Sabin and Feldman[13] and by the complement fixation test. The results are presented in table I, together with information on the time relationships of the studies.

The most striking finding to be noted is that the entire sample of 21 cases gave positive reactions to the dye test for toxoplasmosis. Only three of the serums showed titers below those which are generally considered significant in a conservative evalution. Even if these three are considered negative, 85.7 per cent of the sample is positive for Toxoplasma antibodies. On the basis of Feldman's survey data,[3] it might be expected that anti-Toxoplasma antibodies would be present in 50 per cent of people from the general population with the age distribution of the group studied here. The probability of detecting antibodies in 100 per cent of such a sample of 21 from the general population would be 1 chance in over 2,000,000. The probability of detecting antibodies in 18 persons of a similar sample of 21 would be one chance in 1,342, or $P = 0.0007$. These figures dwarf any consideration of the likelihood that considering the long period of time in some instances between enucleation and serologic testing, antibodies may have been acquired in some cases after enucleation. Hence it is extremely unlikely that the 21 cases reported here represent a random sampling of the general population, and it is evident that there is a correlation between the presence of parasites in the eye and the presence of antibodies for Toxoplasma in the serum. Conversely, the data allow further examination of the significance of low dye test titers.

The results of clinical, laboratory, and survey studies of the past five years now permit us to make an adequate interpretation of dye test titers in the diagnosis of suspected cases of congenital toxoplasmosis, or of systemic disease due to the acquired infection (Sabin et al.[12]). Titers of 1:256 up to over 1:16,000 in infants and their mothers are generally found in the congenital disease, and titers rising to the same high levels are found in the acquired infections. Low titers of 1:16 or 1:64 are commonly found in normal individuals, and these are considered indicative of past infection but not evidence of the toxoplasmic etiology of current illness.

In the series of 21 cases under consideration here, all but 3 show such low

TABLE I

SEROLOGIC TEST RESULTS AND OTHER DATA ON PATIENTS WITH HISTOPATHOLOGICALLY DIAGNOSED TOXOPLASMIC CHORIORETINITIS

AFIP ACC. NO.	PREOPERATIVE HISTORY, DURATION OF SYMPTOMS	UNILATERAL OR BILATERAL	AGE AT TESTS	TIME FROM ENUCLEATION TO SEROLOGY	DYE TEST	C.f TEST	CEREBRAL CALCIFICATION
289604	6 mo.	U	16	2 yr.	1:64	Neg.	Neg.
180418	9 mo.	B*	25	7 yr.	1:16	Neg.	
313108	7 mo.	U	25	3 yr.	1:16	Neg.	
482589	4 mo.	U	28	1 yr.	1:16	Neg.	
161182	3 mo.	U	28	7 yr.	1:16	Neg.	Neg.
298310	4 mo.	U	29	2 yr.	1:4	Neg.	Present
281891	1 yr. 2 mo.	B*	33	3 yr.	1:64	Neg.	Neg.
541058	3 yr.	U	35	3 mo.	1:16	Neg.	
84822	2 mo.	U	38	11 yr.	1:16	AC	Neg.
130487	6 mo.	B	38	8 yr.	1:2	Neg.	
551423	8 mo.	U	41	3 mo.	1:32	Neg.	Present
154482	10 mo.	U	42	8 yr.	1:16	Neg.	
238453	1 yr. 3 mo.	U	45	3 yr.	1:2,048	Pos.	
165904	5 mo.	U	44	6 yr.	1:64	Neg.	Neg.
95175	4 mo.	U	44	10 yr.	Undil.	Neg.	
563586	2 yr.	U	59	4 mo.	1:32	Neg.	
493829	7 mo.	U	66	8 mo.	1:64	Pos.	
281886	6 mo.	U	66	2 yr.	1:32		
286700	6 mo.	B*	70	3 yr.	1:32	Neg.	
162235	9 mo.	U	77	5 yr.	1:256	Pos.	
598327	4 mo.	U	38	1 mo.	1:256		

*This indicates that the lesion in the remaining eye was old and healed.

dye test titers. Four cases were tested serologically three to eight months after enucleation, and in none of these was the titer higher than 1:64. In known instances of acquired toxoplasmosis, in which the antibody titer has been measured over several years, high dye test titers have been recorded for much longer periods of time. Hence it is unlikely that the time between enucleation and serologic testing can be used in all cases as an explanation for the low titers seen here. We have, therefore, the apparently contradictory circumstances that (1) there is a correlation between positive pathologic findings and the

presence of antibodies for toxoplasmosis, and (2) the antibody titers observed in these cases of uveitis are practically all low. In an attempt to explain this situation, we can examine three possibilities:

1. The parasites present in the eyes of these 21 cases of uveitis are not Toxoplasma but cross-react serologically with this parasite.

2. The parasites are Toxoplasma, but represent the residua of congenital infection.

3. The uveal tract infection is due to acquired toxoplasmosis and the persistence of the parasites in the eye after their disappearance from the extraneural tissues has resulted in little antigenic stimulation so that the antibodies measured by the dye test are low in titer.

In regard to the first possibility, there is little evidence that other organisms cross-react with Toxoplasma in the dye test. Of other parasites which might be mistaken for Toxoplasma in tissue sections, Encephalitozoon and an organism soon to be described and named Besnoitia jellisoni by Frenkel, from Peromyscus, the white-footed mouse, have been tested in the Laboratory of Tropical Diseases. Rabbits infected with Encephalitozoon have shown dye test titers of no higher than 1:4. Rats showing titers of 1:4 have been found to have spontaneous infections with Encephalitozoon. Two rabbits infected with the organism from Besnoitia jellisoni have shown titers of 1:8 up to 1:32 one month after intradermal inoculation. These two rabbits succumbed to subsequent challenge with Toxoplasma. On the other hand, rabbits infected with an avirulent strain of Toxoplasma show antibodies of 1:16,000 or higher one month later, and are immune to challenge with a virulent strain. The only other organism reported to cross-react with Toxoplasma is Sarcocystis (Mühlpfordt[11]). This observation is yet to be confirmed. Furthermore, while individual spores of Sarcocystis could be confused with Toxoplasma, the developmental stages of the former are reported to be considerably different (Scott[14]) and rosettelike forms such as described by Wilder[15] could hardly be expected at any stage. Coupled with the fact that Sarcocystis has a predilection for muscle, these considerations make it appear highly unlikely that this organism is involved here. All told, present information in favor of the possibility that the protozoa demonstrated in eyes enucleated from adults are only antigenically related to Toxoplasma is hardly impressive.

The second and third possibilities to consider can be examined together on the basis of the other data given in the table. Seven of the patients were examined by roentgenography for the presence of cerebral calcifications. In only 2 of these were calcium deposits recorded. This is an incidence of about 28.6 per cent, as compared with 63 per cent of congenital cases reported by Feldman. Admittedly, our data are too few to negate the congenital origin of these cases of chorioretinitis, but they hardly lend it support. Considering the age of the patients, the parasites would have had to lie dormant for over forty years, as in one of the patients with cerebral calcifications, and up to over seventy years in our oldest case, before symptoms of eye damage appeared. In only 4 of the patients were the ocular symptoms noted for more than one year prior to enucleation. Furthermore, only 3 of our cases showed bilateral chorioretinitis; in the congenital cases it is almost invariably bilateral.

On the other hand, the low dye test titers and the few positive complement

fixation tests observed in this group of patients, especially in those tested during the first two or three years after enucleation, do lend credence to the idea that the infection was one of long duration. The question of the length of time that parasites may lie dormant in humans is not likely to be answered except under the most fortuitous circumstances. We do know, however, that latent infections can be produced in laboratory animals, such as rats, mice, rabbits, and pigeons (Jacobs[8]). Furthermore, in surveys of the prevalence of Toxoplasma in wild rats (Eyles[2]) and in pigeons (Jacobs, Melton and Jones[10]) the parasite has been demonstrated in tissues of the animals by subinoculation technics although serologically there was no evidence of infection. Similarly, in a pigeon which was kept in the laboratory for almost three years after experimental infection, the dye test titer dwindled to an insignificant value, although parasites were readily demonstrable in the brain but not in the liver or spleen (Jacobs, Melton and Cook[9]). It is therefore considered not unlikely that parasites may persist for relatively long periods in humans. It is also conjectured that the antibody response to these latent encysted parasites could vary depending on their localization. Thus, organisms residing in the brain or retina might cause little stimulation of antibody production, while parasites located in other parts of the body could induce more. On this basis it is possible to explain not only the low antibody levels seen in this group of patients but also the three relatively high titers of 1:256 and 1:2,048. In the latter cases, Toxoplasma organisms may have been present in extraneural tissues as well as in the eye.

The distinction between congenital and acquired toxoplasmosis may be a matter of degree rather than kind, as suggested by Frenkel and Friedlander.[5] The distinction is based on the different character of acute toxoplasmosis as manifested in infants as compared with juveniles and adults, and also on the fact that among definitely established cases of infection in adults, such as the mothers of toxoplasmic infants, no chorioretinitis has been observed. Considering the number of such cases and the relative prevalence of Toxoplasma infection and chorioretinitis, however, this is hardly surprising. The localization of parasites within the eye is a chance occurrence, and the opportunity for it, a function of the rapidity with which the defensive mechanisms of the host respond to the parasite. The infection may be fulminating in the fetus, but only rarely symptomatic in the adult. It is conceivable that on occasion in adult or juvenile toxoplasmosis parasites may localize in the eye and much later be responsible for uveitis. A possible mechanism of pathogenesis under such conditions has been described by Woods[16] and Frenkel and Friedlander.[5]

The structure of this discussion has been based on a small number of cases, in which statistically highly significant results have been obtained. The ultimate demonstration of the toxoplasmic etiology of uveitis must come by the isolation and identification of parasites from typical cases. Until such evidence is obtained, the question of the significance of the dye test for toxoplasmosis in the diagnosis of ocular disease will not be resolved. However, on the basis of our present thesis it is suggested that aside from rising titers the only dye test results which can be considered really significant are those which are completely negative. Those which are very low, such as undiluted or 1:4, may be of no significance in the presence of active lesions. Those which are very high, consistently over 1:1,000, may be indicative of toxoplasmosis. Intermediate titers merely indicate that toxoplasmosis may

be considered in the differential diagnosis, but there appears no basis for the postulation that titers of 1:256 are more definitely diagnostic than lower values. The data on the complement fixation test results on the group of patients reported here indicate that this test is of no value in the diagnosis of old infections. At least for the present it does not appear likely that serologic testing will furnish an easy method for the diagnosis of toxoplasmic chorioretinitis; it will provide merely one other datum for the ophthalmologist to consider in his complete medical survey of his individual patient.

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DISCUSSION

MICHAEL J. HOGAN, M.D., San Francisco, Calif.: Dr. Jacobs and his co-workers are to be commended for their zeal in attempting to arrive at a definitive diagnosis in the cases of chorioretinitis previously reported by Mrs. Wilder. They have given us excellent evidence that their 21 cases of chorioretinitis exhibiting parasites histopathologically had significant Toxoplasma-methylene blue dye test titers. I was particularly happy in their conclusions in which they avoided all attempts to establish titer levels in various age groups as of significant value. We, and the people we have consulted who are toxicologists and immunologists, feel strongly that attempts should not be made to establish titer levels as significant in various age groups except in the zero to 10 age group, in which most people find the methylene blue dye test titer negative or an extremely low level. Their conclusions seem to be most correct that these findings might be of no value in aiding the diagnosis of isolated cases of ocular toxoplasmosis with similar low titers. It is at this point that many authors have erred, and there is ample evidence that isolated titers of 1:1,024 or even

1:2,048, if you remember the figure presented by Dr. Feldman last year, are of no significance unless one of three things happen: (1) The high titer persists; (2) The titer decreases fourfold; or (3) The titer increases fourfold.

So far, most of us have not fallen into the error of attempting to interpret the results of a single examination. The value of negative titers remains to be determined.

In our experience among selected cases of possible acquired ocular toxoplasmosis, it is very uncommon to find any changes in the serum titer during the course of the disease. We have been unable to detect similar changes in the aqueous humor titer from similar selected cases.

If one accepts the toxoplasmic etiology of these cases, it becomes a problem to explain such serologic findings, and I favor the thesis that only small amounts of antigen are liberated to stimulate antibody formation. This accounts for low titers we encounter in positive cases. The largest lesion in the eye might measure 8 to 10 millimeters in diameter by possibly a half millimeter in thickness, and contain parasites both in the extracellular and the intracellular stage. Parasites in the extracellular stage might liberate antigen. Those in the intracellular parasitic stage or the so-called pseudocyst stage probably would not liberate antigen. The total number of parasites in the lesion would be small and, therefore, the amount of antigen liberated would be extremely tiny. Frenkel has calculated the amount and published it in a book which was released by the Public Health Service several years ago.

This report again emphasizes that we must be cautious about accepting isolated titers as being of significance.

These papers by Dr. Woods and Dr. Jacobs and their co-workers have forged an additional link in the chain of evidence with regard to the toxoplasmic etiology of uveitis, and we are extremely grateful to them for these studies.

DR. WOODS: First, may I express my appreciation to the various discussers for their highly lucid and conservative discussion of these two papers.

Several rather interesting points have been introduced. One was mentioned by Dr. Hogan on the late exacerbations of congenital toxoplasmic uveitis. We have seen 3 rather peculiar cases along this line, and others have seen similar cases. These patients are usually in the first or second decade of life, they show heavy glial scars of a former granulomatous uveitis and, superimposed on the old scars, develop an acute, nongranulomatous posterior uveitis, without manifest exudates of any kind. These cases run an acute course for several weeks and then subside and leave behind extensive retinal degeneration with scattred remnants of pigment from the pigment epithelium. Thus we have the final picture of old heavy glial scars with the characteristic granular disorganization that occurs after malignant nongranulomatous uveitis.

Frenkel offered the very logical explanation that this type of lesion is due to sensitization of local tissues by the early disease and the late rupture of a pseudocyst in the sensitized tissue, producing the picture of a superimposed allergic reaction. This theory was criticized adversely by Dr. Sabin, but I think the evidence of these few cases indicates that the explanation advanced by Dr. Frenkel is logical and certainly gives obvious explanation for this peculiar type of lesion.

Dr. Ashton brought up another interesting point regarding what I have called "unrelated positives." He used the very happy phrase, "nonspecific stimulation of antibodies." This observation is not a mere casual observation but it is founded on sound immunologic evidence. Many years ago, Dr. Hekton, working at the McCormick Institute for Infectious Diseases here in Chicago, quite clearly showed a nonspecific stimulus may result in the mobilization of preformed antibodies. For example, a patient with a very low agglutinin titer against typhoid organisms receives a nonspecific protein therapy. Suddenly there may be a sharply rising acute typhoid agglutinin titer in the blood serum. Apparently under the nonspecific stimulus, the preformed antibodies which have lain latent on the cells have swept out into the blood stream and given us a sudden rise in titer. I think it is, therefore, quite possible that the occasional high titers seen in patients who apparently have a perfectly clear-cut syphilitic uveitis or tuberculous uveitis may be the result of a sudden mobilization of preformed antibodies from an old latent, unrelated toxoplasmic infection, and this possibility should be borne in mind in the interpretation of high titers.

With regard to Mrs. Wilder's paper, it is perfectly clear when only 3 of her 21 cases showed high titers, it is almost impossible to place much reliance on late low titers. Her final conclusion to place no reliance on these I think is quite sound and accurate.

One of the discussers spoke of the value

of repeated examinations. Nothing can be more valuable than repeated examinations of the serum of the patient in whom we suspect toxoplasmic etiology, and if we obtain serum every three to four weeks from a patient with active disease and detect a rise in the titer, that is the best evidence we can have. Unfortunately, it is an ideal which cannot very often be obtained. There are very few laboratories in this country where these dye tests can be done accurately and properly. Most of the patients on whom these tests are done are patients who have been referred to these medical centers or to adjoining medical centers where their blood is taken. The patients are there under observation for a week or ten days and then return home and are scattered far and wide. If one writes to their physicians and requests repeated specimens of the serum, sometimes they are received and sometimes they are not. When they do arrive, they are often in a shocking condition. To be able to get the average physician in a small city to take repeated sterile specimens of serum and transmit them to the laboratory for further study is difficult. While I should like to see repeated tests done on all cases, I am afraid from the practical viewpoint we will not accomplish it very often.

Just one last word. I should like to give this word of caution. Through the brilliant work of Mrs. Wilder we perceive a concept of a new possible etiology for endogenous granulomatous uveitis. When we go over the history of medicine we will find that each time a new idea is brought forth it has been received by the medical population in one of three ways. We find one group who enthusiastically grasp it, accept it fully and regard it almost as a new commandment coming down from Mount Sinai. At the opposite end of the spectrum there is a group of people who believe in nothing new, will accept no new ideas, and disregard it. Then we find a smaller group in between who really try to analyze the new idea and study it.

As concerns a Toxoplasma etiology for granulomatous uveitis, I should urge everyone to belong to the last group. It must be admitted that there is good, sound evidence toxoplasmosis is one cause, and possibly a frequent cause, of adult granulomatous uveitis. But there are still many pitfalls in the way. We must be guarded in our diagnosis. We must realize the various difficulties which have been emphasized by Dr. Hogan, by Mrs. Wilder, and by Dr. Ashton and bear these in mind. Our diagnosis should be guarded. If we consider toxoplasmosis in this manner, I think gradually our diagnostic criteria will crystallize. Toxoplasmosis may be an important factor in uveitis, but whether these figures I have shown you today will stand up on further study is something it would take a bold ophthalmologist indeed, to prophesy. All we can do is take the evidence we have now and say that we believe toxoplasmosis is one cause of granulomatous uveitis. It may be a very important cause, but there is still a great deal of work to be done before diagnostic criteria are finally established and we can say definitely how frequently it is a cause.

ANTIHYALURONIDASE AND ANTISTREPTOLYSIN TITERS IN UVEITIS

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THE STUDY of uveitis has long presented one of the most vexing problems with which the ophthalmologist has had to contend. Inflammatory conditions of the uveal tract can be classified generally into three etiologic groups[1]; those caused by injury, those caused by direct extension of inflammatory conditions of other parts of the eye, such as scleritis, keratitis or tumors, and those which are considered to be caused by endogenous infections and their sequelae.

Woods has further classified this third group into two main groups; namely, granulomatous and nongranulomatous.[22,23] Of the granulomatous group, the major causes are thought to be syphilis, tuberculosis, sarcoid, brucellosis, toxoplasmosis and some virus diseases. In these there has been occasional evidence of actual invasion of the uvea by the causative organism.

In nongranulomatous uveitis the cause is thought to be a sterile allergic reaction or a hypersensitivity of the ocular tissues to a specific bacterium or its products. The hemolytic Streptococcus and the Gonococcus have been suggested as the principal offenders. Rarely the Staphylococcus, Pneumococcus, coliform organisms and Hemophilus influenzae may act in this role, but there is only scant proof or information as to this. It is the Streptococcus with which this paper is concerned.

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The streptococci may be divided into the alpha, beta and gamma groups according to their hemolytic reaction. The alpha and gamma groups are either nonpathogenic or only slightly pathogenic to man.

The beta group is further subdivided on the basis of antigenic action into thirteen subgroups designated by the letters A through M.[22] The A group, the most important pathogenically to man, contains at least forty-two antigenically distinct human pathogens. Humans can be infected also with organisms from subgroups B, C, D, F and G. To test a patient for hypersensitivity to the Streptococcus, the test must include one representative of the alpha Streptococcus, each of the forty-two strains of subgroup A of the beta Streptococcus, one each of subgroups B, C, D, F and G of the beta Streptococcus and one representative of the gamma Streptococcus.

It is characteristic of the growing hemolytic Streptococcus to liberate into the surrounding tissue a number of independently acting extracellular substances.[19] The most important of these are (1) streptococcal fibrinolysin or streptokinase; (2) streptococcal desoxyribose nuclease or streptodornase; (3) streptococcal hemolysin or streptolysin and (4) streptococcal hyaluronidase. The first two of these are concerned with the liquefaction of solid sediment made up of desoxyribose nucleoprotein and fibrin. The third is concerned with the hemolysis of red blood cells. There are two serologically dis-

TABLE I

EXTRACELLULAR SUBSTANCES LIBERATED FROM THE HEMOLYTIC STREPTOCOCCUS

1. Streptokinase	Streptoccal Fibrinolysin
2. Streptodornase	Streptococcal Desoxyribose Nuclease
3. Streptolysin	Streptococcal Hemolysin
4. Hyaluronidase	Streptococcal Hyaluronidase
5. (CP)	Cytoplasmic Particles (Streptococcal)
6. (S)	Streptococcal Supernate or Nuclear Fraction

tinct varieties of streptolysin, streptolysin O indicating oxygen sensitivity and streptolysin S indicating solubility or extractability in serum. Number four, commonly called the spreading factor, is an enzyme which breaks down hyaluronic acid. This acid is a mucopolysaccharide and is an important constituent of the intracellular ground substance of connective tissue.[15]

These four extracellular substances liberated by the hemolytic Streptococcus plus two fractional parts of the streptococcal cell, namely the cytoplasmic particles referred to as (CP) and the supernate or nuclear fraction referred to as (S) as shown in table I, being protein in nature, can act as antigens and produce specific antibodies in the blood stream. Todd, in 1932, did the first studies of antistreptolysin titers in the blood stream.[20] He found that antibodies are produced to both streptolysin O and streptolysin S. However, the antistreptolysin S does not show any definite rise in streptococcal disease.[21] Later studies by Humphrey[13] have shown antistreptolysin S not to be an antibody in the true sense of the word but rather a labile lipoprotein complex of the blood. Thus by measurement of specific antibodies in the blood the way was paved for a new approach to the study of diseases of streptococcal origin, especially in those cases where the actual bacteria could not be isolated.

Hyaluronidase, differing slightly from the other mentioned exotoxins, is found normally in testicular extracts and to a lesser degree in kidney extract.[18] In nature it is found in the venom of some poisonous snakes and in the extracts of certain bacteria, namely, the hemolytic Streptococcus, the Pneumococcus, the hemolytic Staphylococcus and certain anaerobes.

Friou and Wenner found that human serum in vitro contained an antagonist to hyaluronidase of the hemolytic Streptococcus.[6] This was found to be specific for the species. It does not inhibit the hyaluronidase of other organisms or of testicular extract. Therefore, although there are various types of hyaluronidase in the body, the fact that the streptococcal hyaluronidase stimulates antibody production, that is species specific, lends a certain specificity to the test.[2,3]

The antibodies in the blood stream produced as a consequence of widely prevalent human contact or infection with the Streptococcus have a characteristic age distribution.[5] They are present in at least low titer in the serum of most adults. Since they are transferred across the placental membrane, they are present in infants in a titer comparable to the adult. This passively acquired antibody is lost after about three months, and until the individual then becomes infected and produces his own antibody his serum may show no titer. After the age of one year the percentage of persons with a measurable titer steadily increases.

Harris and Harris studied the serologic response to streptolysin and streptococcal hyaluronidase in streptococcal infections and in rheumatic infection and found that the geometric mean titer

TABLE II

GEOMETRIC MEAN TITER

YEAR	NORMAL			SCARLET FEVER						RHEUMATIC FEVER ACUTE		
				ACUTE			CONVALESCENT					
	NO. OF CASES	*AH	**ASL	NO. OF CASES	AH	ASL	NO. OF CASES	AH	ASL	NO. OF CASES	AH	ASL
1947	....	....	..→	104	21	39	106	52	120	41	482	224
	185	36	30									
1948	....	....	..→	34	13	45	36	56	148	33	420	240
1949	186	24	36	64	11	17	150	30	98	31	366	298

*AH=ANTIHYALURONIDASE
**ASL=ANTISTREPTOLYSIN

for both antihyaluronidase and antistreptolysin was raised slightly in convalescent scarlet fever and raised markedly in acute rheumatic fever.[8,12] It has not been proven that patients with active streptococcal disease have higher titers than patients with other infectious diseases.[14] The results are partially shown in the following table taken from the work of Harris and Harris[8] (table II).

With the work of these earlier investigators in mind it was decided to measure the antihyaluronidase and antistreptolysin titers of a random series of cases of uveitis in order to learn if any apparent relationship could be shown between this disease and streptococcal exotoxins in the body. Sixty-three cases were chosen at random from the ward service at the Wills Hospital. There were 39 males and 24 females, ranging in age from 16 to 78 years, with a mean age of 37.7 years (see table III).

METHODS AND MATERIALS

Serologic Tests

Antihyaluronidase and antistreptolysin titers and the serums of these patients were tested by Dr. T. N. Harris of the Children's Hospital, Philadelphia, using the mucin clot prevention test and the turbidimetric test on the former and a slightly modified Todd technic which measures the amount of serum required to neutralize two and one-half minimal hemolyzing doses of streptolysin on the latter.[7,9,10]

Clinical Material

These uveitis patients were studied in the active stage of disease. The serums were drawn from the patient between the second and fourth day of hospitali-

TABLE III

AGE OF STUDY GROUP

AGE IN YEARS →	10-19	20-29	30-39	40-49	50-59	60-69	70-79	TOTAL	MEAN
Female	2	11	6	3	1	0	1	24	
Male	3	8	10	8	1	5	4	39	
Total	5	19	16	11	2	5	5	63	37.7

TABLE IV

DIAGNOSTIC GROUPS OF THE CASES STUDIED

CONDITION	CASES
Posterior uveitis	37
Anterior uveitis	17
Posterior uveitis with detachment	2
Boeck's sarcoid	3
Deep keratitis	1
Herpes zoster ophthalmicus	2
Uveitis due to foreign body in vitreous	1
Total	63

zation, but this bears no relationship to the onset of the disease because there was no accurate method of determining exactly how long the pathologic process had existed prior to admission to the hospital. The patients were examined for syphilis, tuberculosis, Boeck's sarcoid, gonorrhea, lymphogranuloma venereum, gout, foci of infection, diabetes, allergy and miscellaneous factors, as shown by the diagnostic survey chart (table IV) which includes 63 cases.

There have been no previous recorded attempts to evaluate the antihyaluronidase titer and only two previous attempts to evaluate the antistreptolysin titer in uveitis. Previous studies of this type have eliminated those cases with a streptococcal infection or a history of streptococcal infection within the six months prior to the study.[1,16] The objection to this is that it might eliminate some cases where the uveitis might have been provoked by the active or recently active focus of infection. We have, therefore, purposely included such cases, although no special effort was made to find cases with such a history.

RESULTS

The arithmetic mean titer of the antihyaluronidase in these cases was found to be 115.63. The geometric mean was 70. These range from a low of 12 to a high of 384 as shown in table V.

Sixty-five per cent of the cases had an antihyaluronidase titer of less than 100, and 82.5 per cent had a titer of less than 200. Thirty-five per cent or 22 cases had an antihyaluronidase titer of over 100. Of these, 19 were found to have a history of recent infection, e.g., upper respiratory involvement or an active focus of infection such as tonsillitis at the time of examination. This could have accounted for the increased titer. Two of this group were proven to have Boeck's sarcoid. The remaining four showed nothing in the history or the physical examination to account for the increased titer.

The arithmetic mean titer of antistreptolysin was found to be 51.6. The geometric mean was 48. These range from a low of 8 to a high of 182, as shown in table VI.

Ninety-seven per cent of cases had an antistreptolysin titer of less than 100 and all were less than 200. Twenty-five or 39.6 per cent of the cases had an antistreptolysin titer of over 50. Of these 20 had positive findings in the history or physical examination that could account for the rise. Five showed no positive findings to account for the rise.

The standard deviations are calculated according to the standard statistical formula.

DISCUSSION

Three major objections may be raised to a study of this nature. First, there are no control groups used, and we, therefore, have to rely on the normal values established by previous investigators in this field. It would be desirable to have controls on the same patients as were studied, during a period of quiescence. Harris, however, using the same methods and the same laboratory in

TABLE V

ANTIHYALURONIDASE U/ML. SERUM

TITER →	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	ARITHMETIC MEAN	STANDARD DEVIATION
Female	9	7	2	2	0	3	0	1	111.3	± 92.5
Male	20	5	2	5	0	3	0	4	124.2	± 118.0
Total	29	12	4	7	0	6	0	5	115.63	± 109.0

HIGH—384
LOW—12
ARITHMETIC MEAN—115.63
GEOMETRIC MEAN—70

TABLE VI

ANTISTREPTOLYSIN U/ML. SERUM

TITER →	0-49	50-99	100-149	150-199	ARITHMETIC MEAN	STANDARD DEVIATION
Female	14	8	1	1	59.25	± 36.2
Male	24	15	0	0	47.2	± 27.2
Total	38	23	1	1	51.6	± 30.8

HIGH—182
LOW—8
ARITHMETIC MEAN—51.6
GEOMETRIC MEAN—48

which the titers for this study were determined established a relative normal for antihyaluronidase[10] by measuring titers in 438 normal subjects ranging from six months to young adulthood, and for antistreptolysin[9] by measuring titers in 145 normal subjects ranging from six months to young adulthood. Second, cultural studies were not feasible in our work and we know nothing of the hyaluronidase production of the hemolytic Streptococcus involved. And, third, casual contacts with the hemolytic Streptococcus in the normal population and brief contacts with acute streptococcal infection would provoke production of a measurable quantity of serum antibody in a large majority of patients.[8]

The means referred to in these studies except where otherwise indicated are geometric means. This is done because the conventional dilutions of serums in such tests result in a geometric series of decreasing concentrations and an arithmetic mean would tend to exaggerate the titers in the upper brackets. The geometric mean titer is obtained by noting the logarithms of the individual titers to the base 2 (since the dilutions are made in twofold steps). The average of the logarithms is then computed and the antilogarithm of this average is the geometric mean.[10]

It will be noted that the geometric mean titer of 70 for antihyaluronidase and of 48 for antistreptolysin suggests an increase over the expected titer for the normal population in this vicinity. The graphic distribution of the titers showed a slight shift to the right, also suggesting a slight increase.

TABLE VII

RESULTS OF SCHONE AND STEEN'S ANTISTREPTOLYSIN TITER STUDIES IN 105 PATIENTS WITH ANTERIOR UVEITIS

	ARITHMETIC MEAN TITER			
	STUDY GROUP		CONTROL GROUP	
		*		*
Female	125.5	±75.78	77.4	±56.29
Male	100.48	±65.16	70.4	±51.60
Total	119.9	±60.60	74.2	±54.20

* Standard deviation

These titers have been previously shown to have a definite increase in acute rheumatic fever[8] and convalescent scarlet fever as shown in table II.

Schöne and Steen[16,17] studied 105 patients in Norway with anterior uveitis of doubtful etiology for antistreptolysin titer. From their study they excluded patients who had or had had within the previous six months a clinical streptococcal infection. They used as a control group a series of 542 blood donors on whom similar titer studies were done. Their results are reported as arithmetic means and are shown in table VII.

They concluded that patients with acute iridocyclitis do not represent a normal material as to antistreptolysin titer in the serum.

Björk[1] studied 52 cases of acute iritis in Stockholm for antistreptolysin of the serum. He used as his normal a titer of 200. Of the 52 cases only 5 showed an increase over the "normal" of 200, with an average arithmetic mean of 101. He concluded that streptococcal infection played a minor role, if any role at all, in the production of acute iritis.

It appears worthy of mention that one reason for the widely varied conclusions drawn by Schöne and Steen, and Björk, would be the different figure taken as normal. Björk's mean of 101 is higher than the normal used by Schöne and Steen but not as high as their study group. However, studies done by different laboratories are not comparable, titer for titer, unless any difference in serum dilution in the actual testing is compensated. If this is not done, then different studies are comparable only as far as percentage deviations from their own normals. For this reason it would be erroneous to compare our arithmetic means with those of Schöne and Steen and Björk.

It should be mentioned also that we have no way of knowing whether a normal population in Norway and Sweden, where the above studies were made, would have a comparable serum antibody level with a normal population in Philadelphia. It would depend on how widely prevalent the hemolytic Streptococcus is in the two populations.

With the suggested rise in titer for antihyaluronidase and antistreptolysin in a random series of uveitis cases, the question arises as to whether testing for titers of antibodies for the various streptococcal exotoxins might not be of help in establishing the etiologic diagnosis in cases of uveitis of doubtful origin. The following discussion taken from the work of Harris, Harris and Nagel[11] is pertinent in this regard.

It is the relative range of titers rather than the relative mean titer that is important, for regardless of the difference between the mean titer of the study group and the normal group, the test for diagnostic purposes is limited by the overlapping of the frequency distributions of titers in the two groups.

There are technical problems in arriving at a method of comparing relative frequency distributions in normal and study groups. The concentrations of serum antibodies in the population occurs in a continuous distribution but serologic tests must be conducted in discrete steps of serum dilution, each

TABLE VIII

PERCENTAGE FREQUENCY DISTRIBUTION OF ANTIHYALURONIDASE AND ANTISTREPTOLYSIN TITERS IN NORMAL AND IN UVEITIS PATIENTS

TITER	ANTIHYALURONIDASE		ANTISTREPTOLYSIN	
	NORMAL	UVEITIS	NORMAL	UVEITIS
<8—8	19.5	0	18	1.5
12—16	20	12.3	7	17.8
24—32	22	20	35	17.9
48—64	19	21.5	20	46.3
96—128	14	16.9	20	14.9
192—256	5.5	21.6	—	1.6
384—512		7.7		

dilution containing all serums within it and also up to the next dilution. Estimates of the separation of frequency distributions of serologic titers will hardly ever yield data by which tests can be quantitatively compared if the calculations are based on the titers actually used in the test. While such data present an impression to the degree to which normal and uveitis serums are separated in a given test, they make an accurate comparison impossible because of the number of percentages involved.

The problem of quantitatively comparing estimates of separation of uveitis and normal titers for the respective test involves the computation for each test of an antibody concentration such that the percentage of normal serums showing antibody concentrations below that value will equal the percentage of uveitis serums having an antibody concentration above it. That percentage will give a single numerical index of the separation of the two groups of titers for the test referred to as IRD (index range difference) and will be directly comparable to similarly derived indices of other tests. A higher index for a given test would mean greater separation of the distributions of titers between the normal and the uveitis groups and greater usefulness of the test. An index of 50 would mean that the test was entirely without value for diagnosis, since half the uveitis serums would have antibody concentrations above the titer corresponding to the index and half the normals below it. A theoretical index of 100 would be ideal, implying infallibility of the given test in the laboratory diagnosis of the disease. Within the range indicated, this index offers a measure of the relative usefulness of a given test.

A method of arriving at such an index which takes into consideration the factors mentioned above is as follows:[4,11]

For the purpose of illustrating we may refer to the data on frequency distribution of hyaluronidase titers in table VIII. The data to be analyzed can be arranged in a manner similar to that in the table. Each column should then be accumulated downward and for each

individual percentage we would substitute the total up to and including that percentage. We then note the sum of the pair of accumulated percentages for each titer. In the case of the lowest titer for which this sum exceeds 100, the two components of this sum are denoted as branded for normal and uveitis distributions respectively. The two cumulated percentages immediately above these whose sum has fallen just short of 100 are similarly indicated by a and c in the same order. The index is then given by

$$I = \frac{bc - ad + 100\ (a - b)}{a - b + c - d}$$

TABLE IX

INDEX OF RANGE DIFFERENCE (IRD) BETWEEN ANTIBODY TITERS OF NORMAL AND UVEITIS PATIENTS TO 2 STREPTOCOCCAL ANTIGENS

	IRD	TITER
Antihyaluronidase	64.4	70
Antistreptolysin	60.8	48

Table IX shows the index for the two tests under consideration. The most useful test appears to be that for antihyaluronidase as a titer exists above which lie 64.4 per cent of titers found in uveitis cases and below which lie a similar percentage of titers in the normal population.

This IRD, along with the increased geometric mean titer and the shift in the frequency distribution, suggests that this group of cases of uveitis taken at random does not represent normal material with regard to serum antihyaluronidase and antistreptolysin. The IRD, however, indicates that the test is of low diagnostic significance in this particular group.

This compares favorably with work done previously on antistreptolysin titers in uveitis. Previous studies for antihyaluronidase in this disease have not been noted in the literature at the time of this writing.

CONCLUSION

Sixty-three cases of uveitis were studied for serum levels of antihyaluronidase and antistreptolysin.

The increase in geometric mean titer, the shift to the right of the frequency distribution of titers as compared to the normal, and the IRD of 20 per cent above the minimal useful point all suggest that the cases of uveitis in this study do not represent a normal group with regard to serum antihyaluronidase and antistreptolysin.

The data presented here suggest that the hemolytic Streptococcus may play an etiologic role in the production of uveitis; also that these tests, particularly the antihyaluronidase titer, should be studied further as a possible method of detecting the etiology in cases of uveitis.

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DISCUSSION

ALAN C. WOODS, M.D., Baltimore, Md.: Drs. Leopold and Dickinson are to be congratulated on their report. Like other original work of Dr. Leopold, it is well thought out, pertinent to the subject and well presented. What he has done is essentially to use a somewhat new approach to the study of the possible role of streptococcal infections in uveitis. His method has been to determine the incidence of certain specific Streptococcus antibodies in uveitis patients. In the Wilmer Institute we have studied the same problem by

different means—the search for specific hypersensitivity to streptococci in the different types of uveitis, and the determination of the results of specific desensitization in patients in whom such a hypersensitivity has been demonstrated. It is interesting that using these different approaches to the same problem, we have reached pretty much the same conclusions.

It has been known for some years that hemolytic streptococci secrete certain specific substances, among the most important of which are a hyaluronidase and a lysin. These substances are quite specific in their antigenic action, and as a result of streptococcal infections these substances are absorbed by the host and inhibitory antibodies against them appear in the blood stream. The occurrence of these antibodies has been determined in a variety of streptococcal infections, scarlet fever, rheumatic fever, rheumatoid arthritis, upper respiratory tract infections, etc.

The rise and fall of various titers during the acute phases of infection and in the convalescent stage have been studied, and their relation to other Streptococcus titers determined. Although positive titers of low degree occur in normal individuals (for all mankind is more or less exposed to these common pathogens), it has been well established that their occurrence over certain mean figures is almost certainly indicative of an active or a past streptococcal infection. It has not been established that the occurrence of these inhibitory substances has any role in any later symptomatology which the patient may develop. I should like to emphasize that we have no evidence whatsoever that these titers, the formation of these antibodies, have any role or play any part in any subsequent disease. Unlike a specific bacterial hypersensitivity which results from an infection, and which may predispose the patient to a variety of unpleasant sequelae, a high concentration of autostreptolysin or autostreptohyaluronidase in the blood serum apparently does not predispose to later disease, or influence the course of later infections to any appreciable degree. The demonstration of their presence in higher than normal concentration is, therefore, only evidence that these patients have undergone some severe streptococcal infections.

Drs. Leopold and Dickinson in this well-designed study have shown that uveitis patients as a whole do not constitute a normal group as regards these streptococcal titers and by inference have suffered streptococcal infection to which they have reacted by the formation of these antibodies. By further inference, one might well suppose these prior streptococcal infections, not the increased titers, are related to the etiology of some of the uveitis. With this conclusion I am in full agreement. I should like to go a little further and reaffirm my belief that in nongranulomatous uveitis, this relation with prior streptococcal infection is due to the development of a specific Streptococcus hypersensitivity.

Drs. Leopold and Dickinson did not divide their cases into granulomatous and nongranulomatous groups, so the incidence of these specific antibodies in the two groups cannot be compared one with the other. They did state there were three cases of sarcoidosis and two cases due to herpes zoster in their series. They can be forgiven this omission, interesting as the result would have been, for had they made this division the number of cases in each group would probably have been so small they would have been without statistical significance.

I congratulate the essayists on their paper. It is another step forward in demonstrating the important role prior streptococcal infections probably play in uveitis. I trust they will continue their difficult studies, and later report to us on the relative occurrence of the streptococcal antibodies in clear-cut granulomatous and nongranulomatous patients.

FRANK W. NEWELL, M.D., Chicago, Ill.: The data presented by Drs. Leopold and Dickinson are additional evidence of the importance of streptococcal infection in the etiology of uveitis. The recent studies by Woods and his co-workers have indicated the significant role of these organisms in nongranulomatous uveitis by demonstrating, first, that a significant number of individuals with such infection have a hypersensitivity to specific members of the group A hemolytic Streptococcus and secondly, producing clinical improvement in these patients by systemic desensitization with a specific Streptococcus vaccine. These tests require a large number of standard type cultures together with elaborate instruments for measuring dosage. They are not in general use.

We were hopeful, therefore, that the work of Leopold and Dickinson in titrating antistreptolysin and antihyaluronidase would distinguish patients with uveitis likely due to streptococcal infection from those with inflammation due to other causes. The results of Leopold and Dickinson, and earlier studies by Schöne and Steen, and Björk suggest that there is no simple direct relationship between elevated titer and either granulomatous or nongranulomatous uveitis. As brought out by Dr.

Leopold, in a large group of patients with all types of uveitis, the group as a whole shows a higher antistreptolysin and antihyaluronidase titer than a similar control group. The antigen pattern for any specific individual within the group, however, is not characteristic enough to distinguish between the normal and diseased patient. This low diagnostic significance of an elevated titer was stressed by the speaker who suggested that such a finding of increased titer might be comparable to the nonspecific findings of an increased sedimentation rate or an increased leukocyte count in uveitis.

Streptococci contain a number of antigens which give rise to relatively large quantities of antibodies. The streptococcal antihyaluronidase antibody appears in greatest quantity, particularly when measured by the mucin clot prevention technic. Increase in any of these antigen titers suggests previous infection by the streptococci. Possibly in so far as the diagnosis of uveitis is concerned, the lowest titers are the most significant in indicating with fair reliability that there has been no recent streptococcal infection.

However, the basic problem in nongranulomatous uveitis, as in rheumatic fever, where the Streptococcus is commonly implicated, is to learn the basic factors which predispose to tissue involvement distant from the initial streptococcal disease. The usual explanation of specific tissue sensitivity does not explain why only certain structures, such as the joints, the eye or the heart are involved, or why systemic involvement is not as universal as streptococcal infection.

It would be of unusual interest and importance to learn if a distinct antigen pattern is present in patients with nongranulomatous uveitis and increased skin sensitivity to the Streptococcus. Of the same significance would be serial titration for antistreptolysin and antihyaluronidase during the course of desensitization or of spontaneous remission of the inflammation. This novel approach of Leopold and Dickinson suggests many possibilities for further studies in uveitis and the solution of many of the problems of this frequently puzzling condition.

DR. LEOPOLD: I want to thank Dr. Woods and Dr. Newell for their kind and constructive criticism. There is no doubt that this study might benefit by a breakdown of future uveitis cases into granulomatous and nongranulomatous forms. It is possible that as more information is obtained, the nongranulomatous group will have a higher incidence of elevated titers.

As mentioned by the discussers, it would be helpful to know what the titers of each of these patients will do as the disease passes into an active phase and then becomes quiescent. We have followed a few of these patients and have found the titers to remain elevated for approximately four months. There were a number of elevations of titers which occurred following upper respiratory infections and bore no relationship to the activation of uveitis. A few individuals have shown an elevation of titer two weeks after the recurrence of the uveitis.

Much remains to be done with this test. There are many perplexing problems. As Dr. Woods pointed out, this high titer may have no relationship to the development of sensitivity to the Streptococcus by the ocular tissue. This may account for the fact that many of the cases with glomerulonephritis and acute rheumatic fever which give high titers against these antigens fail to demonstrate any uveitis. These tests simply demonstrate an association of the Streptococcus with the disease uveitis.

MARFAN'S SYNDROME (ARACHNODACTYLY) WITH ECTOPIA LENTIS

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and
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A white male aged 25 was admitted to Good Samaritan Hospital on September 9, 1952, because of sudden onset of pain in the left side of the chest radiating to the back. He died shortly after admission to the hospital.

He was first examined at the age of 11 years at the Oregon Medical School Ophthalmology Clinic. At that time a diagnosis of Marfan's syndrome associated with ectopia lentis and myopia was made. Both lenses were found to be dislocated. His corrected vision was O.D. 20/40+2; O.S. 20/30. He was examined periodically thereafter in the ophthalmological clinic. Examination revealed central round pupils which reacted *sluggishly* to light and accommodation. The fundi showed mild changes associated with myopia. His general appearance was that of a typical case of Marfan's syndrome showing slender build with slight muscular development, scoliosis, pigeon chest, and long slender hands and feet.

An autopsy was performed by Dr. William L. Lehman of Good Samaritan Hospital. Both eyes were removed at the time of autopsy and forwarded to the John E. Weeks Memorial Laboratory, Oregon Medical School, for histologic study. Characteristic skeletal muscular changes were recorded in the autopsy report (fig. 1).

FIG. 1—Typical long, slender, spider-like hands.

The heart showed thickening along the free margin of the mitral valve. This was not marked; however, there were also a number of tiny red papillae which could be verrucae. The coronary ostia were found to be small and were surrounded by a rather swollen aortic wall. The layers of the aorta were found to be separated from the base of the heart down to the junction of the common iliac arteries with a saccular dilatation of the celiac artery. These layers were separated by clots. However, not all of

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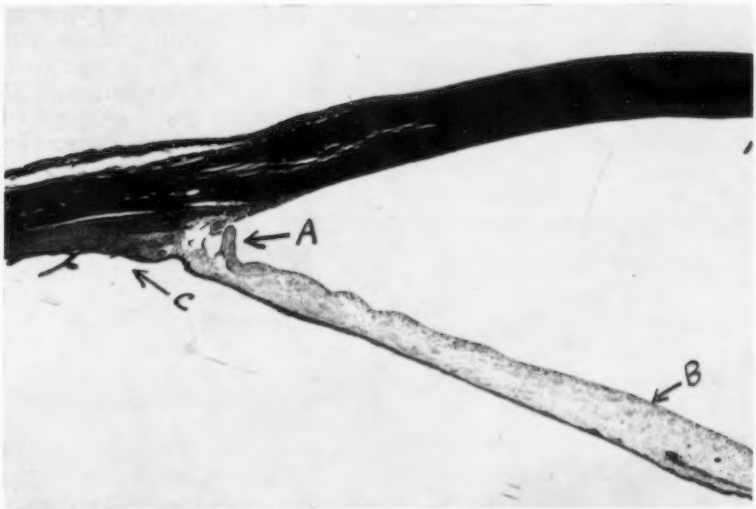

FIG. 2—Iris processes and strands in the filtration angle (A). Iris showing lack of crypts and collarette, with an endothelial membrane on the anterior surface (B). Ciliary body is small and flat with few circular muscle fibers (C).

the wall was filled with a blood clot. This dissecting type of aneurysm appeared to have embarrassed the coronary artery.

The ophthalmic pathology report by Dr. Reeh was as follows:

The eyes measured AP 26 mm. and 24 mm. horizontal at the equator. The lenses were small, spheroid in shape, partially opaque and dislocated. The right lens was dislocated temporally and slightly downward, lying against the ciliary body. The left lens was dislocated nasally and slightly downward, lying against the ciliary body also. Both eyes showed a moderate amount of depigmentation of the ciliary body. The ciliary body of each eye appeared to be abnormally small. There was also a moderate amount of depigmentation of the retinal pigment. The pathologic changes in both eyes appeared to be similar.

A detailed study of the right eye is, therefore, presented. The cornea appeared to be slightly increased in diameter. It was slightly thinner than normal, especially in the region of the apex. The epithelium was normal. On each side the endothelium abruptly became flattened and attenuated. However, there was no abnormal hydration of the overlying stroma or epithelium. The filtration angle demonstrated numerous iris processes and strands which extended from the anterior portion of the trabeculum to the iris similar to the pectinate ligaments found in lower forms. Prominent vessels were seen coursing through some of the larger processes (fig. 2). The trabeculum was present and in general demonstrated only areas of enmeshed pigment granules. Schlemm's canal was present and appeared to be normal in size and position. On one side the angle was enlarged due to the backward displacement of the iris base resulting from the pull of the dislocated lens on the ciliary processes. The surface of the iris did not show the normal fluffiness and presence of crypts. There was an absence of the iris collarette.

A prominent blanket of branching chromatoblasts was associated with an endothelial membrane (fig. 2). Many of the iris vessels appeared to be thickened and hyalinized with some endothelial proliferation. There were a few inflammatory cells scattered throughout the iris. They were, for the most part, lymphocytes, plasma cells and plasmacytoids. There were also a few Russell bodies present. The pigment epithelium of the iris showed evidence of atrophy and cystoid degeneration.

In some sections near the periphery there appeared to be a lack of pigment in the outer layer of cells. A dilator muscle, while present, was much thinner than one would expect to find in a normal iris. The sphincter muscle showed evidence of slight atrophy and beginning hyaline degeneration. The ciliary body was small, flat and demonstrated only a few circular muscle fibers. The processes were few in number and markedly attenuated. They were drawn backward and appeared to lie almost flat against the pars plana (fig. 2). On one side the periphery of the iris was drawn backward by the ciliary processes which were attached to lens zonules. There was evidence of hyaline degeneration of the processes. Nearly all of the processes showed degeneration of the pigment epithelium and there were some areas where the pigment was entirely absent. A few inflammatory cells were present in the ciliary body, mostly in the region of the major iris circle. The zonules were thin, irregular in arrangement and rather heavily sprinkled with pigment granules. Some of the zonules were broken and displaced and could not be traced from the lens to the ciliary body. The lens was small and spheroid in shape. The outer fibers were lightly stained and showed some fragmentation of the fibers and scattered vacuole formation. There was also evidence of early calcification in this region (fig. 3). The sclera appeared to be thinner than normal, especially in the region of the equator. The choroid appeared to be mildly atrophied. There were scattered areas of depigmentation of the attached retinal pigment epithelium. The optic nerve proper appeared to be normal. There was an endothelial membrane which stretched across the physiologic cup. The central retinal artery appeared somewhat thickened with some hyalinization of the wall and with some endothelial proliferation. The nerve sheaths showed evidence of proliferation of the arachnoid with scattered, partially laminated bodies. The bulk of the hypertrophied arachnoid showed pink staining cells. However, on the outer portion there was a layer of compact cells with bluish staining nuclei. The nuclei of these cells were both round and spindle shaped. They appeared to have arisen from the same structure as the pink staining cells. The retina was normal except for pathologic changes which are frequently found in eyes removed at autopsy. The retina appeared to have been a normal functioning structure during life.

The principal pathologic changes in both eyes were slight thinning of the outer coat, enlargement of the globes, slight enlargement of the corneas, anomalous filtration angle, absence of fluffy stroma, crypts, collarette, associated with an endothelial membrane on the anterior surface of the iris. There was slight infiltration of the iris and ciliary body with chronic inflammatory cells. There was a poorly developed dilator muscle, atrophy and cystoid degeneration of the iris pigment. A dislocated, small, spheroid, partially opaque lens in each eye was associated with poorly developed, stretched and ruptured zonules. The ciliary body of each eye was atrophic, associated with thin, attenuated processes and poorly developed circular musculature. Despite the anomaly found

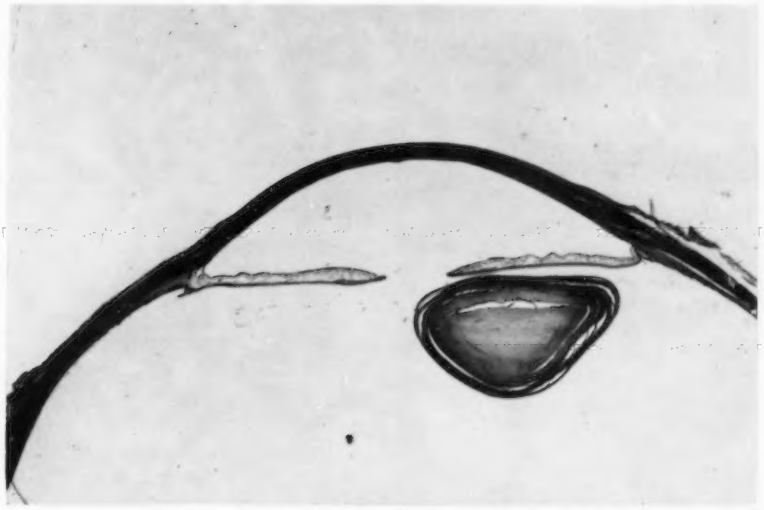

FIG. 3—Dislocated small cataractous lens spheroid in shape.

in the filtration angle, this patient never demonstrated any evidence of increased intraocular tension during his period of observation. Despite the infiltration of the iris and ciliary body, with chronic inflammatory cells, there was no evidence of congestion or pain nor any notation in his clinical record of the presence of cells or aqueous ray elicited with the slit lamp and biomicroscope.

SUMMARY

Marfan's syndrome is said to be familial and hereditary, and in many instances dominant. It appears to represent a mesodermal defect. Approximately 50 per cent of the cases reported have had associated ocular defects.[1] It is important that all physicians be aware of the large number of atypical cases of Marfan's syndrome which may have associated ocular defects.

The sparsely developed dilator muscle associated with the abnormal iris accounts for the poor dilatation of the pupil. This is of utmost importance when an attempt is made at extraction of the dislocated lens. An iridectomy will be necessary to afford proper space for lens delivery.

The small, spheroid lens with little if any, support from the zonules presents a most difficult problem when an attempt is made at lens extraction. This lens is extremely hard to grasp and may be unfortunately lost in the vitreous during an unsuccessful attempt at removal.

The cornea and sclera are thin and one may completely perforate the globe when making a partial incision (groove) for insertion of limbal sutures.

Retinal separation occasionally occurs in these cases, especially after cataract extraction. If retinal separation develops, one should attempt reattachment surgery without delay.

The poorly developed ciliary body may produce aqueous inadequately after surgery, resulting in severe hypotony with ultimate loss of the eye.

In general these eyes present many difficulties when they are subjected to major surgery. It seems obvious, as shown in this case, that one should be reluctant to attempt surgery unless clear-cut indications exist. When surgery is necessary, it should be done under the best circumstances possible by one who is experienced and qualified in ophthalmic surgery, with adequate preparations for control of all possible complications which may arise.

Ophthalmic pathology studies made at the John E. Weeks Memorial Laboratory, Oregon Medical School, Portland, Ore.

General pathology studies made at the Good Samaritan Hospital, Portland, Ore.

Gratitude is expressed for the kind assistance given in the histologic study of this specimen by Dr. A. Ray Irvine, Jr., Los Angeles, Calif.

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THE ROLE OF VITREOUS DETACHMENT IN APHAKIC AND MALIGNANT GLAUCOMA

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INTEREST in pathologic changes within the vitreous cavity has been increasing in the past few years. Most of this interest has stemmed from improved technics of viewing the vitreous. The new slit-lamps with coupled illumination and microscopic systems, such as the Goldmann and the Zeiss, plus the use of the Hruby lens have made vitreous examination practical. As a result, the instability of the vitreous gel is becoming better understood, and its degenerations recognized by the modern ophthalmologist.[6] Varying degrees of retraction and collapse of the vitreous are found in a large number of otherwise normal eyes. In patients over 50 years of age, vitreous detachment is found in over 50 per cent of the eyes.[9]

In pathologic conditions of the inner eye, this degeneration of the vitreous is almost the rule. For example, it is found in 90 per cent of the cases of retinal detachment examined by Pischel.[9] It is common in long-standing uveitis. It can be demonstrated in almost all eyes which have had intraocular surgery, and is responsible for the frequent complaints of muscae volitantes seen by these patients (fig. 1). The author has even seen a vitreous detachment occur shortly after an eye with wide angle glaucoma was thrown into hypotony for a few days after the use of floropryl. Any sudden or profound change in the physiologic or metabolic balance of the eye, even normal aging, is enough to start an irreversible deterioration of the vitreous gel into a sol. Discrete opacities on the surface of this retracted vitreous may be seen by the patient entoptically, or by the oculist with ophthalmoscope or slit lamp. It is not surprising that these changes can occur in eyes suffering from various types of glaucoma. Occasionally the vitreous detachment becomes important in pupillary block glaucoma. In the cases quoted in this paper, the diagnosis has been made by the Goldmann slit lamp and the Hruby lens, or by the aspiration of vitreous and retrovitreal fluid.

FIG. 1.—A composite cut-away view of an aphakic eye, showing a posterosuperior vitreous detachment.

PUPILLARY BLOCK GLAUCOMA

The term "pupillary block glaucoma" refers to a condition in which there is relative or absolute block to aqueous flow through the pupil. Aqueous is then dammed up behind the iris and an attack of glaucoma may be expected. There are four clinical entities in which this block becomes significant.

From the Division of Ophthalmology, University of California Medical School.
Presented at the Fifty-Eighth Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 11-16, 1953, Chicago, Ill.

Iris Bombé

In this condition there is an obvious pupillary block due to posterior synechias. It is easily cured by iridectomy or transfixion.

Narrow Angle Glaucoma

In a narrow angle eye the anteriorly placed iris-lens diaphragm causes a relative pupillary block and a so-called "physiological iris bombé." If this becomes sufficiently exaggerated, an attack of narrow angle glaucoma will occur. An iridectomy, as described by Barkan[1] and Haas and Scheie,[5] will cure this condition if anterior synechias have not formed.

Vitreous Block of the Pupil

This type of block can occur in aphakic eyes, or in those with subluxated lenses. Actual iris synechias to the vitreous may be present, or pupillary constriction around a plug of vitreous extending into the anterior chamber may cause the glaucoma.

Malignant Glaucoma

After surgery for glaucoma this dread complication may occur. The area of filtration is blocked by a forward movement of the lens. If the lens is removed, a vitreous block may supervene, with continuation of the malignant glaucoma.

Although detachment of the vitreous is seen sooner or later in the first two conditions, it is only in the third and fourth that the detachment is of significance in the production of the secondary glaucoma. Therefore, only the third and fourth types will be discussed in this paper.

VITREOUS PUPILLARY BLOCK

In aphakic eyes and in those with subluxated lenses, a block to forward flow of aqueous can be produced by the vitreous. An excellent paper by Chandler and Johnson[4] describes the various aspects of this syndrome. Ophthalmologists have long been familiar with the glaucoma produced by iris bombé. The mechanism of pupillary block glaucoma in the aphakic eye has been less clear, although a few authors in the past, such as Bowman[2] and Hudson,[7] have made shrewd deductions. A more comprehensive explanation seems possible by the application of new findings in the field of vitreous detachment. The clinical course of these cases depends upon the character of the vitreous detachment and on the synechias which form between iris and vitreous. The vitreous is firmly attached to the pars plana of the ciliary body. This is called the base of the vitreous body. It is less firmly attached around the optic disc. When a posterior detachment occurs, the attachment to the disc often pulls free, forming the circular opacity on the posterior vitreous face which is so commonly seen ophthalmoscopically. If aqueous collects behind the iris and in front of the base of the vitreous body, it pushes vitreous inward away from the ciliary body. This is known as an anterior vitreous detachment.

Following round-pupil intracapsular cataract extraction, a herniation of vitreous is often seen projecting through the pupil into the anterior chamber. This causes no harm if no block to the forward flow of aqueous exists. However, a small sacculated hernia can cause glaucoma if the peripheral iridectomy is impatent. The increase in tension is made worse by miotics, as it pulls the pupil down around the vitreous plug and increases the resistance to aqueous outflow into the anterior chamber. Aqueous then collects behind the iris, producing an anterior vitreous detachment and displacing the vitreous. Dilation of the pupil by 10 per cent neosynephrine will lower the tension in this type of case. Reese[10] suggests that the patient be laid on his back when the

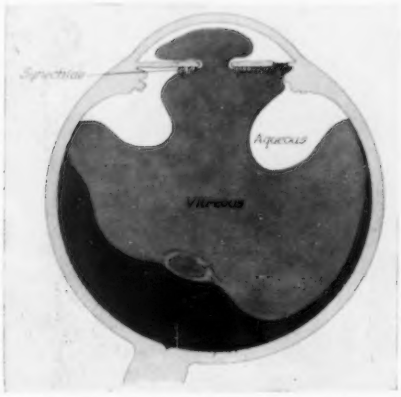

FIG. 2—Pupillary block glaucoma in an aphakic eye with vitreous pushed into the anterior chamber by an anterior collection of aqueous. Both an anterior and a posterior vitreous detachment are shown diagrammatically.

FIG. 3—Microscopic section of a whole mount of an eye with pupillary block aphakic glaucoma, showing posterior vitreous detachment. Vitreous has been shoved into the anterior chamber.

pupil is dilated. Then a miotic should be used to constrict the pupil. If no synechias are present between iris and vitreous such a procedure may accomplish a cure. In the majority of cases, synechias are present and the success of the dilation and miosis therapy is dependent upon breaking these synechias by the movement of the iris.

If the synechias are not broken, the glaucomatous process is maintained. Iris can be seen to be plastered to the anterior vitreous face in both the areas of the pupil and of the iridectomy. Attempts to dilate the pupil meet with only moderate success. It is usually possible to achieve mid-dilation but slit lamp examination shows that this dilation has been achieved by stretching the face of the vitreous without actually breaking the synechias.

Although this syndrome is more commonly seen with round-pupil extractions, it is by no means limited to them. It is quite possible for the edges of the coloboma of a full iridectomy to become adherent to the vitreous. When this occurs, the picture is somewhat similar except that there is a less localized herniation of vitreous. The character of this herniation is dependent upon the type and extent of synechias binding iris to vitreous.

When the synechias are limited to the iris adjacent to the pupil and coloboma, aqueous collects behind the iris and causes an anterior detachment of the vitreous (fig. 2). This squeezes vitreous out through the pupil in the form previously described (figs. 3 and 4). However, it is possible for the synechias to extend over the entire posterior surface of the iris to the ciliary body. When this happens, the aqueous forces the whole vitreous-iris diaphragm forward (fig. 5). The aqueous either collects in a pocket in front of the base of the vitreous or occasionally filters behind a detached vitreous body. There is a shallowing of the anterior chamber which may be uniform or of varying depths. The shallow chamber calls attention to the pupillary block mechanism and is less likely to be misdiagnosed than that in which there is a deep chamber containing vitreous. In both instances the

FIG. 4—High power microscopic section of figure 3 showing iris adhesion to vitreous with aqueous collection behind iris. Anterior synechias are present.

treatment must be directed to restoration of free flow of aqueous into the anterior chamber. If this can be achieved by alternate dilation and contraction, such a medical regime is to be preferred.

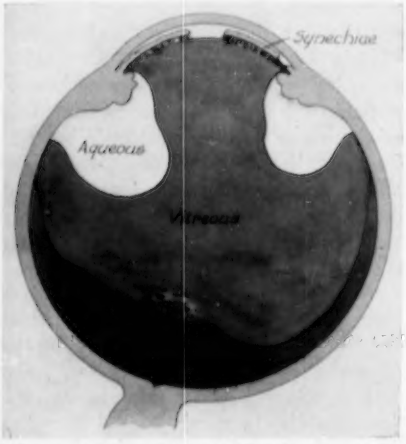

FIG. 5—Aphakic pupillary block glaucoma with a shallow anterior chamber.

More commonly, an iridectomy or a transfixion is necessary. This should be carefully done to avoid trauma to the vitreous. In performing an iridectomy, a conjunctival flap is turned down and a small ab externo incision is made. Before entering the chamber, a McLean suture is placed. It is then possible to enter the chamber, pick up peripheral iris and perform an iridectomy with a minimum of intraocular trauma. After tying the McLean suture, the anterior chamber is refilled with air or saline through the incision or through a preplaced beveled Ziegeler knife-needle incision. This should cause a recession of the previously herniated vitreous and restore a normal depth of chamber. If the iridectomy happens to be made where vitreous adhesions are present, it may be necessary to do a peripheral iridectomy in another area.

After iridectomy, it is sometimes possible to see that vitreous is actually adherent anterior to the ciliary processes. If a complete block were present, aque-

ous would be forced to flow back into the vitreous. The location of an anterior detachment or pocket may be hard to find. If it can be located, the iridectomy should be made in that area. Of course, peripheral anterior synechias may also be present and add another complication which must be corrected by cyclodialysis or synechialysis.

The same mechanism has been seen with subluxated lenses, as noted by Hudson[7] and by Chandler and Johnson.[4] A wedge of vitreous curls over the edge of the subluxated lens in such a way that aqueous can no longer get past it to the pupil. Such a mechanism for the glaucoma is illustrated by the following case:

A 60-year-old grocer was struck in the left eye by a box falling from a shelf. He had immediate blurring of vision, followed in several weeks by pain in the eye. On examination at the University of California Eye Clinic, he was found to have a normal right eye and a very shallow chamber in the left eye. The cornea was hazy and the tension of 70 (Schiøtz) failed to respond to miotics. It was impossible to see into the chamber angles in the affected eye.

Because this was thought to be a secondary type of glaucoma, neosynephrine 10 per cent was instilled. The pupil dilated to mid-position. Within an hour the anterior chamber had become normal in depth and gonioscopy showed open, grade two angles everywhere except above. There were peripheral anterior synechias from nine to twelve. The most notable finding was a pronounced iridodonesis. The lens was subluxated downward and fell backward. Tension had dropped to 35. A wedge of vitreous could be seen curling around the upper pole of the lens. Despite maximal pupillary dilation, within a day the chamber had again become shallow; the lens was pushed against the iris and again no iridodonesis was present; the tension was elevated. A large posterior superior collapse of the vitreous body could be seen with the Hruby lens. The lens was evidently being pushed forward into the anterior segment by aqueous collecting in or behind the detached vitreous.

At the time of surgery, a full iridectomy was performed and the lens removed by an erisophake without apparent loss of vitreous. Closure was affected by McLean sutures. The postoperative course was uneventful. The anterior chamber remained deep and the tension remained soft. Through the iridectomy, the posterior vitreous detachment was more easily seen. In the area of the coloboma, vitreous could be seen attached anterior to the ciliary processes. No actual channel for posterior flow of the aqueous could be seen, but from the clinical course it would seem that this is the most logical explanation. Aqueous goes behind or into the detached vitreous and shoves it forward against the lens, effectively blocking the pupil and the aqueous pathway to Schlemm's canal. The iridectomy, the removal of the lens, or both, reopened the anterior route for aqueous flow and resulted in a cure of the glaucoma.

It seems that the aphakic eye and the eye with a subluxated lens can develop the same type of secondary glaucoma. In the first type it may be possible to prevent the complication by more care in the operation and the postoperative period, as pointed out by Dunnington in his discussion of the paper of Chandler and Johnson.[4] Postoperative iritis is reduced by carefully performed surgery. This will help avoid inflammatory membranes and synechias. It seems probable that full iridectomies make total vitreous synechias less likely. If round-pupil cataract extractions are to be done, care should be taken to have one or two amply large peripheral iridectomies. In the postoperative period it is most important to keep the pupil mobile. The common practice of instilling pilocarpine after surgery and then allowing the pupil to remain miotic is particularly dangerous. It is wiser to use 2 per cent atropine every two or three days in order to keep the iris moving. If the pupil is dilated, pilocarpine 2 per cent is instilled. If there is an undue iritis, cortone ointment is instilled occasionally in addition to the routine use of aureomycin ointment. By these measures, synechias to the vitreous are kept at a minimum.

MALIGNANT GLAUCOMA

Malignant glaucoma is one of the nightmares of the ophthalmic surgeon. It is an entity which follows an operation for glaucoma in which the anterior chamber cannot be re-formed or is collapsed in a day or two. The eye again becomes hard and efforts made to restore a normal pressure fail.

This condition has not been seen in wide angle glaucoma and is rare in acute narrow angle glaucoma. Other authors such as von Graefe,[12] Priestly Smith[11] and Chandler[3] have noted this predilection. In a personal communication, Chandler stated he had never seen a malignant glaucoma in a narrow angle case in which tension could be normalized preoperatively. He has seen several malignant glaucomas following surgery for a first attack of acute narrow angle glaucoma. All cases seen by the author have been in chronic narrow angle glaucomas in which the base pressure had been elevated due to extensive peripheral anterior synechias. In several of these, small patent areas for aqueous outflow could have been seen gonioscopically. This had resulted in a compensated type of narrow angle glaucoma with no history of acute episodes. A balance is evidently achieved between decreased production of aqueous and decreased outflow without precipitating an acute attack.

When surgery is attempted in these cases, the trauma results in closure of the remaining area of open angle or an upset in the tension balance. The next day the eye is stony hard, with absence or extreme shallowness of the anterior chamber. It is thought that these eyes have a detached vitreous and that the fundamental mechanism in this catastrophe is similar to the aqueous collection behind the vitreous in some of the previously described conditions. The lens is forced forward, assuming the ball-valve effect mentioned in the literature, particularly by Chandler.[3] Lens removal should always cure these cases, but such is not always the case. Instead, the vitreous may move forward to fill the position vacated by the lens, and the malignant course continues.

The following case report is a striking example of the mechanism involved, though it is a sad record of therapeutic failure. The author saw the patient in consultation with Dr. Michael J. Hogan, and assisted him in the subsequent surgery.

The patient was a 50-year-old white housewife. Her only complaint was of poor vision in her right eye of one year's duration; there was no history of pain, halos, or other symptoms suggestive of acute glaucoma.

Physical examination:
Vision: Right eye: light perception
Left eye: 20/30
Tension: Right eye: 60 (Schiøtz)
Left eye: 60 (Schiøtz)
Fields: Right eye: central light perception only
Left eye: 6 degrees with 2 mm/IM white object

The corneas were clear. The anterior chambers were extremely shallow with iris seemingly in contact with the posterior cornea except in the most central position. The media were clear. Deep glaucomatous excavation of the optic discs could be seen.

Intensive miotic medication, sorbitol, retrobulbar novocaine, etc., were ineffective. After posterior sclerotomies, bilateral iridencleises were done uneventfully, but it was impossible to re-form the anterior chambers, and the eyes were stony hard the next morning.

Bilateral intracapsular cataract extractions were performed that day. A posterior sclerotomy was done to soften the eyes before the ab externo section. It was easy to demonstrate the extent of the vitreous detachment by the aspirating needle. Nothing could be aspirated through a No. 22 gauge needle until the tip was beyond the middle of the eye. In order to withdraw vitreous from the front of the eye, at least a No. 18 gauge needle with much vacuum was needed, showing the solidity of the vitreous residue. Four-tenths cubic centimeter of solid vitreous was aspirated and 2 cc. of retrovitreal fluid. Three McLean sutures were then placed and the lenses easily

removed intracapsularly. The sutures were tied. An attempt was then made to re-form the anterior chamber. To the surprise of the surgeons, saline flowed into the anterior chamber and went back through the pupil; the vitreous came forward; the eye became hard and no chamber was formed. A number of vitreous or subvitreal aspirations were done to decrease vitreous chamber pressure; the iris was freed from the posterior cornea by a spatula and saline was injected. Each time the eye became hard. When air was injected, it also began to run through the pupil and behind the iris, so the attempt was abandoned. The chambers remained completely collapsed in the following days. Evidently the ciliary body was not producing aqueous, as the tension remained low. It was not due to a leaky wound, as saline injected into the anterior chamber promptly raised the pressure. With a Koeppe lens, the vitreous could be seen through the iridectomy to be adherent anterior to the ciliary processes though no anterior vitreous loss had occurred. The posterior chamber was clear, and a posterior detachment of the vitreous was easily visible with the Goldmann slit lamp, even without the Hruby lens.

Two weeks later, when the ciliary body resumed production, the tension elevated immediately. It was thought essential to break the block produced by anterior vitreous adhesions, plus freeing the peripheral anterior iris synechias which must have formed as the result of the long opposition to the cornea. A conjunctival flap and an ab externo corneal section were made. An attempt was then made to dialyse the vitreous adhesions to the ciliary processes with an iris spatula. This was done with great difficulty. Eventually, a solid sheet of detached vitreous was pulled free and removed by forceps. Now when saline was injected, the anterior chamber promptly formed. The anterior synechias were dialysed, and the eyes were closed with a McLean suture. The tension remained normal and the anterior chamber was deep from that time on. A clear channel could be seen between retrovitreal space and anterior chambers, running through one fourth of the peripheral portion of the detached vitreous.

The pathologic report on the vitreous sheet which was removed was "sheets of vitreous containing a few inflammatory cells and fibroblasts. The vitreous is attached to a small piece of tissue made up of pigmented and nonpigmented cells from the pars plana of the ciliary body." This demonstrated the firm attachment of the vitreous base as described by Irvine[8]. The final chapter, unfortunately, was written six weeks later when a massive oral disinsertion and retinal detachment occurred. Surgery failed to reattach the retina. The patient has only light perception. The eyes are soft and not painful.

FIG. 6—Narrow angle type of eye showing the crowding of anterior segment. A posterior vitreous detachment is shown.

Such an unhappy result is frequent in malignant glaucoma. It occurs in the narrow angle eyes because of their anatomy (fig. 6). The forward position of the lens allows the vitreous to lie well anterior along the ciliary processes and inflammation may weld zonules and vitreous into a membrane adherent to the ciliary processes. This is particularly true when the lens has been removed. The irreversible character of this syndrome is due to the adherence of vitreous to iris and ciliary processes in such a way that aqueous can flow backwards into the detached area. Evidently, some valve-like mechanism prevents flow anteriorly (fig. 7). This adherence must be made much more firm by the inflammation attendant upon surgery. If there is much risk of this dread complication or if the first eye has a malignant glaucoma, it may be wiser to do a lens extraction as a primary procedure to free the anterior

FIG. 7.—Diagram showing schematically the trapping of aqueous behind detached vitreous by a hypothetical valve mechanism.

segment before changes have become irreversible.

An occasional eye of this nature may not have permanent anterior synechias and can be helped by simple peripheral iridectomy. Shortly after the disastrous case previously quoted, an almost identical one was sent the author by Dr. John Gallaher of Walnut Creek, California.

There had been no history of acute attack. Tension was 60 in the right, and 50 in the left eye. Anterior chambers and angles were nonexistent. Only light perception remained in the right eye and a field of five degrees with 20/70 vision in the left. The only difference was that it was possible to force the tension down to 45 (Schiøtz) in the right eye, and to 35 (Schiøtz) in the other by extensive medication. Due to fear of malignant course, no filtering operation was done. Instead, a vitreous aspiration, peripheral iridectomy and anterior synechialysis were performed in the right eye. The left eye was treated only by a peripheral iridectomy. In both eyes, McLean sutures were used to close the incisions firmly. The anterior chambers were refilled with saline through previously placed beveled Ziegeler knife incisions. Although the chambers were very shallow and the eyes looked close to a malignant course in the next four days, they eventually re-established themselves with a tension of 20 (Schiøtz) in each eye, using pilocarpine three times a day. The astonishing gonioscopic finding postoperatively was that most of the angles in both eyes were open. The area of the synechialysis was no better than other portions of the same eye. The absence of congestion evidently permitted iris to remain against the trabeculum without forming true synechias. These dropped free after the iridectomy.

At that time iridectomy seemed safer than iridencleisis or lens removal. Since then, however, the author has had the opportunity of following a case of Dr. Edward Maumenee, in which one eye had characteristics similar to these others.

In this case, a peripheral iridectomy, synechialysis and air injection were performed. The next day the anterior chamber had collapsed and the tension was again elevated. After reducing the tension by a posterior sclerotomy, the lens was extracted intracapsularly without difficulty. Despite careful corneoscleral suturing, it was impossible to re-form an anterior chamber. The iris acted like sticky blotting paper and would not drop free from its adherence to the cornea. Spatulas were used to free iris from cornea. When saline was injected, it ran through the pupil; tension was elevated and no chamber was formed. Air similarly seemed to collect in a pocket in the anterior vitreous behind the iris. Although every effort was made to free vitreous adhesions between iris and ciliary body, no anterior vitreous incision or removal was attempted. The tension remained down for three weeks, then increased. Subsequently, it has been held in the low 30's by two cyclodiathermies. The eye retained light perception.

Shortly after this, a patient with chronic narrow angle glaucoma was operated upon by Dr. John Lordan of Los Angeles, and a malignant course followed.

In the right eye an iridencleisis was done. The next day the chamber was collapsed and the tension was high. The patient was returned to surgery. A posterior sclerotomy, ringed by diathermy, was performed 9 mm. from the limbus. A large gush of aqueous-like fluid was obtained. The lens was then removed intracapsularly and air injected into the anterior chamber. This air had a marked tendency to run back into the vitreous chamber.

The left eye was treated by peripheral iridectomy and air injection, but again the tension was hard and the chamber collapsed the next day. Lens extraction was similarly performed.

Tension of both eyes was fairly good for nearly two weeks before chambers began to become shallow and tension began to rise. At this time it was thought that a vitreous pupillary block must be broken. A Wheeler knife was used to cut vitreous from posterior iris and four incisions were made straight through the anterior vitreous face in both eyes. Immediately following this procedure it was possible to re-form the anterior chambers, and they have remained deep since that time.

Unfortunately an intraocular hemorrhage occurred in the right eye, which subsequently cleared. Tension is normal but little vision remains. In the left eye the patient has 20/100 vision, but tension is still a problem. Paracenteses have been required to keep the tension down. A cyclodialysis is contemplated for the future.

Recently a patient of Dr. David Harrington was seen in consultation.

She had chronic narrow angle glaucoma with a tension of 55 in the right eye. The left eye had narrow angle glaucoma which later required iridectomy to control. Conservative miotic therapy failed to control the right eye. A trephine and then an iridencleisis were each followed within three days by loss of the chamber and recurrence of tension. It was decided that lens extraction must be done to break the malignant course. Vitreous incision was contemplated if there was difficulty in reforming the chamber.

Through a posterior sclerotomy, 1 cc. of fluid vitreous was aspirated from deep in the vitreous cavity. An intracapsular lens extraction was then performed without loss of vitreous. Five McLean sutures closed the incision. Saline would then refill the central chamber but the periphery remained collapsed. A spatula was passed into the angle to free any anterior synechias. Saline would still deepen only the central area. The anterior vitreous face would then slowly come forward and the chamber collapse. After repeated efforts had failed, a Wheeler knife was passed into the anterior chamber from the upper incision line. At the lower pupillary border the cutting edge was turned backward and a clean incision was made through the vitreous into the back third of the eye. It was immediately possible to form the chamber, which has remained deep since then. A vertical slit in the vitreous can be seen extending from the anterior chamber into the retrovitreal space. Tension is 20; vision, 20/70. Corneal edema is clearing above where vitreous is in contact with the cornea.

Dr. David Rosehill of San Jose sent a similar patient to the Eye Clinic of the University of California Medical School.

The patient had had no light perception in the right eye and hand movements in the left eye. There was no history of acute attack. The eyes were identical with the others described in this paper. Iridencleisis had been done in both eyes two weeks before. Postoperatively, the anterior chambers remained collapsed. Tension was 60 (Schiøtz) in each eye when seen in the Eye Clinic. Bilateral lens extractions were performed after retrovitreal fluid was aspirated to soften the eye. Anterior chambers could be formed at first, but rapidly were lost despite six McLean sutures, and the eyes became hard.

Retrovitreal fluid was reaspirated from the left eye. Fluorescein solution was injected into the anterior chamber, which failed to form. The eye again became hard. It was immediately possible to aspirate fluorescein solution from the retrovitreal space. This seems to prove the prompt transfer of fluid from the anterior segment to retrovitreal space. Whether the path of its flow was through existing channels, or through those opened by posterior sclerotomy, could not be said. Flow did occur and the solution was trapped behind the vitreous.

A discission of the detached vitreous body was done in each eye with a Wheeler knife. The anterior chambers then formed, though the left chamber was not deep until the next day. The tension, however, remained elevated, due to peripheral anterior synechias. The sixth day both chambers again became shallow. In the left eye, which retained vision, a cyclodialysis was done below, after a second vitreous incision at right angles to the first. This chamber has remained formed, and tension is 20 (Schiøtz), although it is too soon to determine the final outcome.

The blind right eye had a cyclodialysis and a collar-button seton tied into the sclera behind the detached vitreous. This was devised by Dr. Lee Garron, of the University of California Department of Ophthalmology. It was hoped that retrovitreal fluid might continue to flow out into Tenon's capsule. The chamber in this eye remained deep for five

days and then again became shallow. Evidently the seton had become occluded. No further surgery is contemplated.

MECHANISM OF PUPILLARY BLOCK AND MALIGNANT GLAUCOMA

It is the author's belief that the various types of glaucoma which have been described in this paper are related by two common factors. In the first place there is a pupillary block caused by iris synechias to the vitreous body. Secondly, the aqueous collects behind the iris, displacing vitreous as shown in figures 2, 3, 4 and 5. In some cases there is an actual infiltration of the vitreous by aqueous. Aqueous collects in pockets within the vitreous framework or actually filters behind a posteriorly detached vitreous body. The clinical course of the glaucoma depends upon the position and the extent of the synechias and the position of the aqueous collection.

There is no problem in understanding the anterior aqueous collection. However, there is great reluctance on the part of ophthalmologists to believe the evidence that aqueous can collect in the vitreous or behind it. Yet collections of fluid are plainly visible by slit lamp biomicroscopy and in pathologic specimens. Furthermore, the clinical course of some of these cases is explicable only if there is aqueous collection in the vitreous or behind it. This is true of such cases as the aphakic glaucoma in which vitreous is pushed into the anterior chamber (figs. 2, 3 and 4). The subluxated lens glaucoma in which the lens was pushed into the anterior segment cannot be explained by aqueous collecting anterior to the vitreous, as no mechanism would exist to force the lens forward.

Malignant glaucoma is particularly interesting when viewed from this point of view. Why does malignant glaucoma not occur when it has been possible to normalize the pressure of a narrow angle eye preoperatively? It would seem probable that the aqueous in such eyes is free to flow forward if the pupillary block is broken. In a high tension eye, aqueous flow into the vitreous may have occurred already. Following a filtering operation or iridectomy, anterior flow is not re-established. Aqueous is trapped behind the lens, the detached vitreous, or both. This forces the iris-lens diaphragm forward, closing all drainage channels, and precipitates the malignant course. If this syndrome were due only to the effect of aqueous pushing forward on a large lens, all cases should be arrested by iridectomy and lens removal. Instead, the detached vitreous may be pushed forward, collapsing the anterior chamber and continuing the malignant course. All of these eyes had posterior sclerotomies. It is conceivable that aqueous could run along this tract to reach the retrovitreal space. Here it could be trapped if retrovitreal fluid pressure compressed the detached vitreous against the sclera, closing the channel made by the needle. This possibility deserves further investigation.

The best proof that there is aqueous collecting somewhere behind the hyaloid membrane is obtained by experimenting with the eyes at the time of surgery. For example, aqueous-like fluid can be aspirated from the back portion of the eye and the eye becomes soft. In Dr. Harrington's case, saline would not remain in the anterior chamber, but was forced out as the hyaloid and iris were pushed forward by aqueous formation. As soon as the vitreous was incised, the chamber formed. In Dr. Hogan's and Dr. Rosehill's cases, there was a valve mechanism operating. Saline or fluorescein solution could be injected in front of the iris without forming an anterior chamber, yet the tension would become hard. A similar solution could then be aspirated from the retrovitreal space, softening the eye, but still no chamber

formed. In all of these cases, no chamber formed for any length of time until vitreous was incised. Since that time, they have remained formed. It is interesting to note that the two cases of malignant glaucoma quoted by Chandler[3] in which useful vision was retained after lens extraction had anterior vitreous loss at the time of the operation. This vitreous loss may have produced the free passage for the aqueous which is essential to break the malignant course.

Treatment of Malignant Glaucoma

The cure of malignant glaucoma is entirely dependent upon obtaining a free flow of aqueous from posterior to anterior chamber. To break this pupillary block requires all the skill and ingenuity at the surgeon's command. He must be familiar with the syndrome and its cause. He must be bold enough to initiate proper treatment before irreversible damage to the intraocular structures has occurred. Hesitation is fatal!

The danger of a malignant course should be in the mind of any eye surgeon operating on a narrow angle eye which is running a high base pressure. Every effort should be made to normalize pressure in such eyes preoperatively. This includes the trial of dibenamine or diamox. If it is impossible to lower the pressure or if a malignant glaucoma has been precipitated by surgery on the fellow eye, intracapsular lens extraction as the primary procedure should be done even though no cataract is present. If the eye is still firm after an iridectomy or an iridencleisis, or if tension becomes elevated within a few days with collapse of the anterior chamber, the indication is again absolute for immediate intracapsular lens extraction with wide iridectomy to avoid iris-vitreous synechias. Six or eight tight corneoscleral sutures should be used and the anterior chamber must be re-formed by saline or air when the operation is completed. A posterior sclerotomy may be needed to lower the tension before opening the anterior chamber, but the possibility of opening a tract for posterior aqueous flow should be borne in mind. A cure will result if aqueous is able to continue to flow anteriorly.

If it is impossible to re-form an anterior chamber, or if the chamber collapses in the next week, the detached-vitreous, pupillary-block mechanism is responsible. A simple discission of the anterior hyaloid membrane may be sufficient to break the vitreous block if aqueous is collecting in the anterior vitreous. However, if the anterior chamber cannot be re-formed after this conservative procedure, a deliberate, wide transfixion of the detached vitreous should be done. A Wheeler or Graefe knife should be thrust back through the detached vitreous. This should include the upper vitreous, as there is usually a superior collapse and the residue is thinnest in this area (fig. 1). A large cut should be made halfway back into the eyeball, using every care to avoid injury to the retina or excessive pull on the vitreous base. A second incision at right angles to the first may increase the chance of success. If a free opening between retrovitreal space and the anterior chamber has been created, it should be possible to re-form the anterior chamber.

Most of these eyes have extensive anterior synechias as well. A synechialysis can be performed during this same procedure. However, it is usually wiser to wait two or three weeks and then dialyse the synechias if the tension becomes elevated. An inverse cyclodialysis is the best method.

COMMENT

One cannot say that the hypothesis of aqueous collection within and behind a detached vitreous body has been proven by the observations presented in this paper. Nevertheless, the observed facts do

fit such a hypothesis and give a rationale for therapy in a group of cases which have been real enigmas to the ophthalmologist. Further intensified study is needed to clarify the mechanism and the most desirable mode of treatment. It is hoped that this paper may stimulate this interest so that some of these desperate cases may be salvaged which are otherwise headed for certain blindness.

SUMMARY

Vitreous detachment is present in almost all eyes which have had intraocular surgery and in many eyes suffering from glaucoma. In some aphakic eyes and in eyes with subluxated lenses, synechias can form between iris and the vitreous face producing a pupillary block. Aqueous collects in the posterior chamber, detaching the vitreous anteriorly, or goes behind a posteriorly detached vitreous body, shoving it forward, producing a glaucoma. The anterior chamber can be either collapsed or filled with vitreous. Iridectomy will usually result in a cure of this type of glaucoma.

A similar syndrome is sometimes seen after lens extraction is done to relieve a malignant glaucoma. It becomes impossible to refill the anterior chamber because aqueous runs posteriorly, forcing detached vitreous and iris forward and continuing the malignant course. Only by breaking the pupillary block can this type of glaucoma be relieved. If the aqueous is collecting anteriorly, iridectomy and lens extraction will be helpful. If aqueous is collecting behind the detached vitreous, the only chance of cure is actual incision through the detached vitreous to break the postero-anterior pupillary block.

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DISCUSSION

PETER C. KRONFELD, M.D., Chicago, Ill.: In the study of malignant glaucoma one is very much handicapped by the rarity of this serious postoperative complication. Naturally, I am not complaining about this rarity, nor, I believe, is Dr. Shaffer really looking forward to his next case of malignant glaucoma as an opportunity to validate his theory.

His theory, in principle, implies an interference with the free flow of aqueous behind the plane of the iris, the free flow which is so essential for maintenance of normal ocular tension; the free flow which, as Dr. Shaffer

has made very clear to us, is very different from the diffusion of aqueous into and through the vitreous which takes place in the normal and probably also in the diseased eye. This interference with the free flow of aqueous behind the iris is actually an extended pupillary block mechanism. The fundamental mechanism in Dr. Shaffer's theory is very much the same as that of iris bombé in which the resistance to flow is greater behind than in front of the iris. There is damming up of aqueous behind the iris, whereas at the same time in the anterior chamber the outflow takes place at the normal rate. The natural result is a forward movement of the iris into the bombé position and closure of the angle.

The obstruction which Dr. Shaffer assumes is at a very unusual level. It is apparently close to or anterior to the tips of the ciliary processes, and he has made some biomicroscopic observations through surgical colobomas which seem to support his view.

In addition to this obstruction he assumes a very complicated system of passageways within the vitreous, which I believe are best illustrated in his slides and in the description of what happened during the operation of his second case. I shall repeat just one or two sentences from that description. As you remember, that patient had an intracapsular cataract extraction done, and at the end of the operation, with the wound closed tightly, an attempt was made to restore the anterior chamber.

This is the quotation from Dr. Shaffer:

"An attempt was then made to re-form the anterior chamber. To the surprise of the surgeons, saline flowed into the anterior chamber and went back through the pupil; the vitreous came forward; the eye became hard and no chamber was formed. A number of vitreous or subvitreal aspirations were done to decrease vitreous chamber pressure; the iris was freed from the posterior cornea by a spatula and saline was injected. Each time the eye became hard"

Then air was tried and the result was essentially the same. Air got behind the iris but the chamber was not restored.

Some ophthalmologists, perhaps the majority of you, might react to Dr. Shaffer's theory by rejecting it because of its great complexity and because of the very few observations upon which it is based. Most of those observations were made with the patient and the ophthalmologist in a state of what I might call agony and despair. The theory, however, that was derived from those observations was arrived at by cool, logical thinking. From some of the things that the vitreous has done in some of my patients, I would not put it beyond a highly abnormal vitreous to misbehave in exactly the fashion in which it seemed to have behaved in some of Dr. Shaffer's cases.

I am a little worried about the therapeutic principle that is derived from this theory; that is, the broad incision of the vitreous. In retinal detachment work such broad incisions are usually a failure in the sense that the strands or confining membranes in the vitreous that we want to eliminate do not break. The vitreous, because of its great distensibility and elasticity, just dodges the knife, and a day or two later when you look at the eye again the same strands are still there. I realize that may be an entirely different situation.

I am also worried about this type of surgery because of the inherent danger of a retinal detachment. I was, therefore, very pleased to find in Dr. Shaffer's summary that he is still stressing prompt removal of the clear or slightly opaque lens as the operation of choice in malignant glaucoma, and that he advocates, with some reserve, the incision of the vitreous in the very desperate cases.

I was very pleased to see that he agrees with the concept of temporary cessation of aqueous flow to explain some of the phenomena observed in his cases. Such a temporary reduction or cessation of aqueous flow after surgery I think is becoming more of an established fact. So while the number of observations is small and while the situation in which these observations were made, I am sure, were extremely complex, it would seem to me that there are little pieces of evidence in every case that can be integrated logically into a theory such as Dr. Shaffer has presented here today.

PAUL A. CHANDLER, M.D., Boston, Mass.: It is a pleasure and a privilege to take part in the discussion of such an important paper. I am in full agreement with the author's conclusions in the section dealing with pupillary block after cataract extraction, or in cases of dislocated lenses. These conclusions have been confirmed in the practice of many ophthalmologists and need no further comment.

The section dealing with malignant glaucoma is particularly interesting and important. While there is no denying the effectiveness of the author's method of treatment, the mechanism of malignant glaucoma which continues after lens extraction is to me still far from clear. The author lays great stress on the role of vitreous detachment and has as-

sumed that aqueous moves around behind the detached vitreous, thus pressing it forward and keeping the anterior chamber flat after the lens has been removed. Since, as the author states, vitreous detachment is so common after intraocular surgery, could it not be merely an incidental finding rather than a vital factor in the continuation of the malignant course after lens extraction for malignant glaucoma? Immediately after lens extraction, the entire area behind the iris and including the pupil and coloboma is occupied by the vitreous face. As aqueous is formed in the postoperative period, unless it can come forward between the iris and vitreous face, or pass through the vitreous, it accumulates behind the iris and by occupying space increases the contents of the posterior segment, thus tending to push the vitreous face more strongly forward. It would not appear to make any difference whether the accumulation of aqueous was behind the vitreous, within it, or to one side of it. It seems to me there must be other factors at work in cases of malignant glaucoma.

Malignant glaucoma occurs only in cases of narrow angle glaucoma, and only those in which the glaucoma procedure is done when the tension is elevated. If a malignant course follows an operation on one eye, it invariably follows a glaucoma operation on the fellow eye, providing the tension is elevated at the time of surgery. However, if lens extraction is employed as the initial operation, the malignant course is prevented. On the other hand, if the tension in the fellow eye can be reduced to normal preoperatively, a malignant course will not ensue after a glaucoma operation. Does the vitreous body take up more than the usual amount of fluid during a period of high tension, and does it release this fluid too slowly through the intact hyaloid membrane to prevent a continuation of the malignant course after lens extraction? An experience with one patient suggests that in these cases the maximally turgescent vitreous body may actually be larger in cases of malignant glaucoma. Following iridencleisis on one eye, the anterior chamber remained flat and the tension high. After lens extraction with vitreous loss, the anterior chamber remained normally deep. In the fellow eye tension could not be reduced below 50 Schiøtz. Accordingly, intracapsular lens extraction was chosen as the initial operation, though the lens was clear. This was accomplished without vitreous loss. Now, two years after operation, though tension has remained normal and the angle open gonioscopically, the anterior chamber in the eye in which no vitreous was lost remains strikingly more shallow than that of the fellow eye.

In reviewing my cases of malignant glaucoma, I find that in the two eyes in which lens extraction was accomplished without loss of vitreous, the malignant course with flat anterior chamber continued. One eye was lost. In the other the situation was relieved by peripheral iridectomy and air injection into the anterior chamber, combined with posterior sclerotomy and release of a considerable quantity of vitreous. In the light of Dr. Shaffer's experiences, the favorable result was probably due to the fact that the peripheral iridectomy was, by good fortune, done in an area where aqueous rather than vitreous lay behind the iris and thus a free communication was established for aqueous to come forward into the anterior chamber.

In the light of some of these experiences I had reached the conclusion that if in cases of malignant glaucoma lens extraction was accomplished without loss of vitreous, the hyaloid should be deliberately ruptured. There is some experimental evidence (Dr. Morton Grant, personal communication) in addition to clinical observation, which indicates that the hyaloid membrane offers a considerably greater barrier to the passage of fluid forward from the posterior segment than exists when the membrane is ruptured. In cases of pupillary block in aphakia, I cannot recall seeing a single case with shallowing of the anterior chamber where the hyaloid membrane was not intact.

If the hyaloid is broken in cases of block, while vitreous may continue to advance into the anterior chamber, the chamber does not become shallow.

If a malignant course follows operation on one eye, every effort should be made to normalize the tension in the fellow eye before operation. If the tension can be brought to normal by one means or another, a glaucoma operation can be safely done. If the tension cannot be brought to normal, lens extraction should be the initial operation.

Much remains to be discovered regarding the physiology of the vitreous, particularly in regard to the exchange of fluid into and out of the vitreous with the hyaloid membrane intact and with it broken.

Dr. Shaffer's through-and-through discission of the detached vitreous in two cases resulted in re-formation of the anterior chamber and undoubtedly saved the eyes. I suspect that simple rupture of the anterior hyaloid membrane at the time of lens extraction would have accomplished the same purpose. I have

not seen a malignant course continue after lens extraction in a single case in which there was anterior vitreous loss at the time of extraction. On the other hand, both in Dr. Shaffer's cases and in two of my own the malignant course continued when lens extraction was accomplished without anterior vitreous loss.

Two other points in connection with malignant glaucoma are worth emphasizing. The first point concerns wound closure when the lens is extracted. In lens extraction for malignant glaucoma, the incision is necessarily begun ab externo and finished with scissors. It is therefore bound to be more ragged than the usual incision and more difficult to make watertight. Furthermore, the eye is inflamed and the tissues less strong so there is a greater tendency for sutures to cut out. I believe, therefore, that a minimum of six corneoscleral sutures should be employed in such cases.

The second point concerns the treatment of the fellow normal eye in cases of malignant glaucoma.

In one of our cases, while we were concerned with malignant glaucoma in one eye the patient developed acute glaucoma in the fellow hitherto normal eye. Faced with the certainty that a malignant course would follow operation on this eye unless the tension could be brought to normal, preoperatively, every effort was made to lower the tension medically. After twenty-four hours of intensive treatment with all the antiglaucoma drugs at our disposal, the tension finally was brought to normal. A peripheral iridectomy was done immediately. The postoperative course was uneventful in this eye and the glaucoma is apparently completely and permanently arrested.

This experience illustrates the great importance of prophylactic peripheral iridectomy. If a malignant course follows operation on one eye and the fellow eye is normal, I believe that prophylactic peripheral iridectomy should be done without delay on this fellow normal but predisposed eye. If one waits until the acute attack actually occurs, it may not be possible to lower the tension preoperatively and a malignant course is certain to follow operation.

Dr. Shaffer is to be congratulated on a splendid piece of work. He has pointed out a way to save eyes which would otherwise have been lost.

DR. SHAFFER: A great deal more work is going to be required to ascertain the importance of aqueous collection in and behind the vitreous. The breaking of a vitreous block by incising the vitreous violates surgical principles in which we have good reason to believe. It is to be hoped that some safer way will be found. The best treatment at present is to avoid the malignant course by early surgery of narrow angle glaucoma or by lens extraction as a primary procedure in high tension narrow angle eyes.

I am most grateful to Dr. Kronfeld and to Dr. Chandler for their interesting and constructive comments. I share their mystification at the behavior of some of these eyes, and hope that by cooperative endeavor the mysteries will be solved.

I wish to express my appreciation to Doctors Michael Hogan, Edward Maumenee, John Gallaher, John Lordan, David Harrington, and David Rosehill for their cooperation and their permission to use the case reports of their patients.

In Memoriam

Charles Glenn Baird.....Palo Alto, California
December 3, 1953

Charles Edward Bauer.....Poughkeepsie, New York
December 9, 1953

Ernest Charles Mead.....Gainesville, Texas
February 1, 1954

Arthur Palmer.....New York, New York
February 18, 1954

Josiah Edmund Quincy.....West Roxbury, Massachusetts
February 27, 1954

Paul Jacob Stueber.....Lima, Ohio
December 22, 1953

Fred Sanborn Thorne.....Boston, Massachusetts
December 6, 1953

TRANSACTIONS
American Academy of Ophthalmology and Otolaryngology
Official Publication of the American Academy of Ophthalmology and Otolaryngology

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Editorials

THE FIFTY-NINTH ANNUAL CONVENTION

IN THIS issue of the TRANSACTIONS appears the thirty-third Instructional Program, constituting a part of the Fifty-Ninth Annual Meeting of the Academy. The lecture rooms will be found on the eighth floor of the Waldorf-Astoria Hotel, and the general plan of the courses will follow that of the meetings held in the Palmer House in Chicago insofar as the facilities of the hotel permit. Because of limited space at the registration desk on the second floor, tickets for Instructional Courses will be on sale on the eighth floor at the general office of the Courses. In anticipation of a larger than usual attendance, the courses this year have been increased in number and widened in scope.

An added attraction at the meeting this year will be televised clinics. From the New York Eye and Ear Infirmary dry and surgical clinics will be telecast to the Waldorf-Astoria each afternoon, Monday through Thursday. The television program will be under the direction of Dr. Brittain F. Payne (ophthalmology) and Dr. Swift Hanley (otolaryngology and plastic surgery) and will implement both the Instructional Courses and the Scientific Program.

Scientific Exhibits will occupy the first and second tiers (balconies) of the Grand Ballroom; the technical exhibit will be situated on the fourth floor in the Perroquet Suite, and on the third floor (the Ballroom floor) in the Basildon Room, Jade Room, Astor Gallery, East Ballroom and East Foyer. Access to the general assembly room will be through the technical exhibit.

Alumni dinners will be held as usual on Monday evening, followed by an Evening of Diversion, where light refreshments will be served during the evening. This event is designed for the opportunity it gives for the meeting of old friends and making new acquaintances, and to welcome the new members. President Walter Theobald will make everyone feel at home. A series of novelty acts, selected from among the best niteclub acts in New York, will heighten the interest with entertainment of the highest quality. Then dancing until midnight. The annual banquet will be omitted this year to permit members to enjoy the unusual night entertainment available in New York.

The Scientific Program will be continued on the Bermuda Cruise, described elsewhere in this issue.

Advance registration holds many advantages for members.

WILLIAM L. BENEDICT, M.D.

CONTINUATION DISCUSSION CRUISE

American Academy of Ophthalmology and Otolaryngology

More than 100 deposits were received for the Continuation Discussion Cruise to Bermuda within thirty days after the announcements were distributed. Those deposits and inquiries represented nearly half of the states in the Union and some provinces of Canada. That really shows tremendous interest. That interest still continues.

California and Texas, each, have more bookings than any other state. Ohio and Pennsylvania are crowding them. But percentagewise New Hampshire leads with six cruise members.

The Cruise will make a perfect climax for the Annual Meeting and your summer holidays. A strenuous meeting, a restful cruise, beautiful Bermuda, and back to appointments within a two week period is a possibility.

Bermuda is the vacation center of the generation and every moment spent on this mid-ocean playground brings a new surprise and a new delight. It is a foreign country—as British as London—and it is a lovely little country. Every hour there will be joyously filled with activity or leisure.

Did you see the article on Bermuda in the February issue of National Geographic?

Nowhere in all the world are there landscapes and marine views just like those in Bermuda. They are as enchanting in their loveliness as they are interesting because of their novelty. The Bermudas live up to their title, the Mid-Ocean Paradise.

What can you do in Bermuda? There are delightful excursions everywhere. The Harrington Sound Drive is the most popular half day excursion taking in the South Shore with its lovely estates and visiting the Devil's Hole, Crystal Cave, Perfume Factory, and Aquarium. Another popular drive goes westward to Somerset; and Fairyland is a must because it is one of the finest residential sections to be found anywhere. And you will probably want to see the Marine Gardens from the glass bottom boats. Then you may want some surf bathing or just loafing.

What can you buy? In addition to "seeing" Bermuda as suggested previously, you will have plenty of time for shopping. English woolens and Scotch tweeds, both in piece or ready-made articles; china; perfumes; and many other articles may be purchased at real bargain prices. You may do your Christmas shopping there. It will be easy, convenient and economical and your gifts will be doubly appreciated. Each person may bring back $200 worth of purchases duty free.

To camera enthusiasts, still or movie, Bermuda offers a field day. There is a rare colorful picture everywhere. In your sightseeing around the island you will use a carriage or taxi and so can stop anywhere for such shots as may be desired.

GOOD NEWS

The ship will be used as hotel for the entire cruise. Because of the interest so far manifest in the Continuation Discussion Cruise to Bermuda it seems that it will be impossible to house all the members at any hotel. We have, therefore, cancelled our reservations at the Hotel Princess and have arranged to house the members of the cruise on the "Queen of Bermuda" for the entire period. There will be no increase in price. There will be great increase in convenience. With the "Queen" as our hotel there will be no packing and unpacking ship to hotel, hotel to ship, and again ship to land in New York. There will be only one unpacking, and one packing for the whole cruise. There will be no Cus-

toms examination either in Bermuda. You will be free to leave the ship at once on arrival.

The "Queen" will be anchored in the Great Sound and there will be frequent and convenient tender service between the ship and the pier, about twenty lovely minutes whether by daylight, twilight, or under the moon and the stars. There will be movies and dancing on the ship each evening for entertainment, and one evening of panel discussions.

Write now for full cruise information, plan of the "Queen of Bermuda," rates, etc., to Leon V. Arnold, 33 Washington Square West, New York 11, N.Y. He will be in charge of all cruise arrangements and expects personally to accompany the criuse party. He knows Bermuda well because of his many visits there.

NEW SECRETARIES FOR THE HOME STUDY COURSES

After seven years of constructive service and significant accomplishments, Dr. Lawrence R. Boies, Secretary for Home Study Courses, and Dr. Hendrie W. Grant, Associate Secretary in charge of Ophthalmology, have been succeeded by Dr. Daniel Snydacker as Secretary and Dr. Ben H. Senturia as Associate Secretary in charge of Otolaryngology.

These courses were organized and initiated in 1940 under the direction of Dr. Harry S. Gradle. They were quickly accepted as a valuable aid in the graduate training of physicians for the two specialties, and have since been a part of the training of most ophthalmologists and otolaryngologists.

More than five thousand physicians have received the Courses. In addition to extensive distribution in the Continental United States, each year there are enrollments from men in military service stationed in various parts of the world; from Puerto Rico and the Canal Zone; and from Canada, the Philippines and Cuba. Every year some of the Central and South American countries are represented on the registration list, and the Courses have been sent as far away as India, Iraq, Portugal and Norway. For the current year Brazil and Labrador are examples of the wide geographic distribution in the Western Hemisphere.

A constant endeavor has been made to increase the value of the Courses through study of weaknesses revealed in examination papers submitted for grading, and in the examinations by the American Boards. This has resulted in the incorporation of additional material, reorganization of some of the subjects, better questions, and more constructive criticism of examinations.

The generous contribution of time and talents by the secretaries and faculties are responsible for the important achievements under this program.

C. I. O. M. S.

The Council for International Organizations of Medical Sciences is a nonprofitmaking international organization established in April 1949 under the auspices of the World Health Organization and UNESCO. It is a federation of international organizations in the field of medical science and its purpose is to assist member organizations in their work, secure coordination between the congresses they organize and furnish material aid to them where necessary.

The patterns of international associations vary widely. Some only come into being on the occasion of international congresses; others have continuing activities between congresses. The permanent societies take the form either of international societies of individual members or of federations of national societies. When new societies are being formed, the trend is towards the formation of international federations group-

ing the responsible national organizations in a given field.

One of the first international medical congresses was that of ophthalmology in 1857. For several years following this first congress the meetings were called and arranged by mutual consent and cooperation of ophthalmologists of European countries. In 1927 a permanent Council was formed, and subsequent congresses of ophthalmology were held under its direction. At the XIV International Congress of Ophthalmology held in Madrid in 1933 the International Federation of Ophthalmological Societies was formed, with the International Council of Ophthalmology as the operating committee.

The American Ophthalmological Society was a founding member of the Federation, the only member from the United States until in 1953 the American Association for Research in Ophthalmology was listed in the C.I.O.M.S. Bulletin. In this same Bulletin (Vol. IV, No. 2, January-June 1953) the American Academy of Ophthalmology (sic) is also listed as "affiliated." This listing is premature, as the Academy has not applied for affiliation. The American Medical Association has applied for affiliation on behalf of the Section on Ophthalmology.

There are two auxiliary societies of the International Council of Ophthalmology; The International Association for Prevention of Blindness and the International Association Against Trachoma. Both of these societies are affiliated with the Federation by virtue of their association with the International Congress.

As national societies may be federations of state and local societies (A. M. A.), they in turn join with other national societies to make an international federation. The next step was to organize the federations on a field basis. Hence in 1949 under the egis of UNESCO came the C.I.O.M.S., a society of medical federations and now the godfather to all medical international congresses.

The XVII International Congress of Ophthalmology is being helped by the C.I.O.M.S. It has also the unqualified support of all American and Canadian national societies of ophthalmologists, including the Academy.

WILLIAM L. BENEDICT, M.D.

ANNOUNCEMENT OF THE SIXTH INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY

The Sixth International Congress of Otolaryngology will be held in the United States of America in the Summer of 1957. The exact dates and the place of meeting are, at this writing, still undecided. It will be the first International Otolaryngological Congress to be held outside Europe, and will afford a welcome opportunity to American otolaryngologists to meet and exchange views with their colleagues from all over the world.

The first of the present series of Congresses met in Copenhagen in 1928 under the presidency of Prof. Schmiegelow; it was attended by 600 members representing 41 countries. The second was held four years later in Madrid, under the presidency of Prof. Tapia; the third in Berlin in 1936, under the presidency of Prof. von Eicken.

At the meeting in Berlin, Holland was designated to take the Congress in 1940 and England, tentatively, in 1944. However, the war intervened, the Berlin records were lost, and further plans remained in abeyance until 1947. At that time, the Dutch committee having indicated its temporary inability to undertake a meeting, the British Association of Otolaryngologists agreed to be hosts to the Fourth Congress. This took place in London in 1949 under the presi-

dency of Mr. V. E. Negus, and was attended by some 1,300 members from 45 countries. The Dutch then resumed their obligation and the Fifth Congress was held in Amsterdam, in June 1953, Prof. Eelco Huizinga presiding. The Sixth, to be held in this country in 1957, will be under the presidency of Dr. Arthur Proetz.

Official recognition and sponsorship has always been of the highest order. In Holland the meeting was inaugurated by His Royal Highness Prince Bernard in the name of Queen Juliana, in England by her Royal Highness the Duchess of Kent in the name of King George. In Madrid, the prospective patron had been King Alfonso, but this was 1932 and on this occasion, also, fate took a hand. Between the inception of the Congress and its fulfillment the King had retired into exile and the new President, Alcalá Zamora graced the opening with a memorable address of welcome.

Three official themes usually dominate the scientific programs; while the presentations under these heads are by invited speakers, any member of the Congress is eligible to present a paper on a subject of his own choice, and there are sectional meetings in order to accommodate all of the speakers within the time available.

The Congresses have been extremely successful; scientific contributions are many and varied; new friendships are established and old friendships renewed. They have established a sound basis of mutual esteem and understanding by bringing together representatives of countries throughout the world for personal discussion of mutual problems.

Aside from the scientific sessions, social and cultural programs have been arranged which have included especially conducted tours to points of interest in the host city and country. Following some of the Congresses, arrangements have been made for visits to other parts of the host countries for additional special programs. These were both scientific and social in character, and were very successful additions to the Congresses.

PAUL H. HOLINGER, M.D.
Secretary-General

INTERNATIONAL ASSOCIATION OF EYE, EAR, NOSE AND THROAT SOCIETY SECRETARIES

Twelve years ago this Association was formed at the suggestion of William L. Benedict, Secretary of the American Academy of Ophthalmology and Otolaryngology. From a rather uncertain beginning this small group with indefinite aims slowly grew into a larger group with definite objectives, due in no small part to the guiding hand of its long-time secretary, Kenneth L. Craft of Indianapolis, Indiana, and the continued support of the American Academy of Ophthalmology and Otolaryngology.

Two years ago, under the inspired leadership of then president Moacyr Alvaro of Sao Paulo, Brazil, service to ophthalmological and otolaryngological societies all over the world was envisaged, and the Association became international. The next president, James J. Monahan of Shenandoah, Pennsylvania, vigorously followed up this program, getting in touch with similar groups in other countries.

The present administration is dedicated to the development of this program. One of the first projects is the issuance of a Bulletin, edited by capable past-president Paul C. Craig of Reading, Pennsylvania, for international distribution.

From those who have labored to aid this program we request continued support; from those now actively participating we urge continued interest; to those whom we now approach we entreat your interested cooperation.

EDLEY H. JONES, M.D.
President

MEETINGS OF FOREIGN SOCIETIES

ARGENTINE CONGRESS

Time and Place: 1957 in Buenos Aires, Argentina

President: Dr. Carlos S. Damel, Casilla de Correo 2699, Buenos Aires, Argentina

ASSOCIATION INTERNATIONALE DE PROPHYLAXIE DE LA CECITE

Time and Place: May 23-27, 1954 at Paris, France

President: Dr. P. Bailliart, 47 Rue de Bellechasse, Paris 7, France

CANADIAN MEDICAL ASSOCIATION, SECTION OF OPHTHALMOLOGY

Time and Place: June 18, 1954—9:00 A.M. to 12:00 Noon in Vancouver, Ontario

Secretary: Dr. Clement McCulloch, The Medical Arts Building, Toronto, Ontario

CANADIAN OPHTHALMOLOGICAL SOCIETY

September 9, 1954—Physical Sciences Center, McGill University
To be followed by the XVIIth International Congress of Ophthalmology

June 16-18, 1955—Bigwin Inn, Muskoka, Ontario

Secretary: Dr. R. G. C. Kelley, 90 St. Clair Avenue, West Toronto, Canada

CANADIAN OTOLARYNGOLOGICAL SOCIETY

June 13-15, 1954 — Harrison Hot Springs, British Columbia

June 16-18, 1955—Bigwin Inn, Muskoka, Ontario

Secretary: Dr. W. Ross Wright, 361 Regent Street, Fredericton, New Brunswick

INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS

Time and Place: Week of September 13, 1954 in New York City during the XVII International Congress of Ophthalmology

Sceretary: Prof. A. Franceschetti, Clinique Ophtalmologique, Hôpital Cantonal, Geneve, Switzerland

INTERNATIONAL BRONCHOESOPHAGOLOGICAL SOCIETY

Time and Place: October 11-13, 1954 at Lisbon, Portugal

Secretary: Chevalier L. Jackson, M.D., 3401 North Broad Street, Philadelphia 40, Pa.

INTERNATIONAL COUNCIL OF OPHTHALMOLOGY

Time and Place: September 9, 1954 at Montreal, Canada
1955 in France or Great Britain

Secretary: Dr. Edward Hartmann, 2 Avenue Ingres, Paris (16°), France

INTERNATIONAL FEDERATION OF OPHTHALMOLOGICAL SOCIETIES

Time and Place: September 11, 1954 at Montreal, Canada
1958 in Brussels, Belgium

Secretary: Dr. Edward Hartmann, 2 Avenue Ingres, Paris (16°), France

THE NOVA SCOTIA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Time and Place: May 17, 1954 at Saint John, New Brunswick

Secretary: E. I. Glenister, M.D., 513 Barrington Street, Halifax, Nova Scotia

PAN-AMERICAN ASSOCIATION OF OPHTHALMOLOGY

Time and Place: June 11-17, 1954—Interim Meeting—at Sao Paulo, Brazil

Acting Secretary: Daniel Snydacker, M.D., 109 North Wabash Avenue, Chicago 2, Illinois

SCANDINAVIAN OPHTHALMOLOGICAL CONGRESS

Time and Place: June 10-12, 1954 at Göteborg, Sweden

General Secretary: Dr. Lars Oberg, Kungsportsavenyen 15, Göteborg, Sweden

SCOTTISH OPHTHALMOLOGICAL CLUB

Time and Place: October 30, 1954—Clinical Meeting—at Glasgow, Scotland
March 1955—at Edinburgh, Scotland
October 29, 1955—at Glasgow, Scotland

Secretary: Dr. John D. Fraser, 31 Kingsborough Gardens, Glasgow, W. 2, Scotland

HELENOR CAMPBELL WILDER

HELENOR CAMPBELL WILDER

Announcement has been received of the recent retirement of Mrs. Helenor Campbell Wilder as chief of the Section of Ophthalmic Pathology at the Armed Forces Institute of Pathology. Mrs. Wilder's thirty years in the laboratory of the Army Medical Museum and the Armed Forces Institute of Pathology have been crowned with success in the attainment of her lifelong ambition as a worker in the field of biological sciences. On May 2, 1953, she was honored as Woman of the Year for science by the Woman's National Press Club. To a long list of achievements, which gained for her international recognition as an ophthalmic pathologist, will soon be added the Exceptional Meritorious Award, the highest civilian award in the Department of Defense.

Mrs. Wilder demonstrated larval forms of Toxoplasma organisms in necrotic and highly disorganized intraocular masses that had puzzled pathologists for years. Another disease found chiefly in children was also shown by Mrs. Wilder to be caused by migration of the larval stage of a worm. Mrs. Wilder's demonstration that blindness in these cases was due to infection rather than tumor enabled the attending physicians to institute appropriate treatment and indicated channels for future research.

She is the first woman to be elected an honorary member of the American Academy of Ophthalmology and Otolaryngology. Mrs. Wilder also holds membership in the American Association of Pathologists and Bacteriologists, which represents the only time in the history of that organization that an individual without an M.D. degree was accepted.

Mrs. Wilder was co-author of the text and bore the entire responsibility for the illustrations in the Atlas and Textbook of Ophthalmic Pathology produced by the American Academy of Ophthalmology and Otolaryngology and the Armed Forces Institute of Pathology.

SECTION ON INSTRUCTION

FIFTY-NINTH ANNUAL MEETING

American Academy of Ophthalmology and Otolaryngology

September 19-24, 1954
WALDORF-ASTORIA HOTEL
New York, N. Y.

DEAN M. LIERLE, M.D.
Secretary for Instruction — Otolaryngology and Maxillofacial Surgery

A. D. RUEDEMANN, M.D.
Secretary for Instruction — Ophthalmology

This Section presents for 1954:

Otolaryngology: 115 Individual Courses; 32 Continuous Courses and Panel Discussions. The faculty is comprised of 169 instructors and the total number of instruction hours is 326.

Ophthalmology: 112 Individual Courses, including 10 Home Study Course discussion periods; 51 Continuous Courses. The faculty is comprised of 206 instructors, and the hours of instruction total 400.

General Instructions

Only members who have paid their 1954 *dues may order instruction tickets in advance of the meeting.* Members should order tickets only for their own use. Candidates for fellowship in the Academy are not privileged to reserve tickets in advance. After the session opens, no distinction between members, candidates and guests will be made in selling tickets.

Each period (1 hour) of instruction costs $2.00. *Orders unaccompanied by properly executed checks will not be filled.* Checks should be made payable to W. L. Benedict, M.D.

In case of inability to attend the meeting after order has been filled, a refund will be granted if requested prior to September 17.

If courses requested are not available and it is impossible to substitute, a refund will be granted. Refunds will not be sent by mail. A blue refund card will be placed in the Advance Registration Envelope which is received at the time of registration. This should be presented at the Instruction Desk, Room 805 of the headquarters hotel, for payment.

All orders for tickets will be filled according to postmark on envelope containing check. Telegrams will not be honored. Previous to August 31, send orders to 100 First Avenue Building, Rochester, Minnesota; after August 31, mail orders direct to W. L. Benedict, M.D., c/o Waldorf-Astoria Hotel, New York, N. Y. Advance orders will not be filled if received after September 16.

Ordering Instruction Tickets

An *individual* course is complete in one (1) period. Most individual courses are repeated on two or three different days allowing the subscriber to choose the day on which he wishes to attend.

A *continuous* course lasts two (2) or more periods as indicated. It is not possible to purchase a ticket to only *part* of a continuous course.

At the end of this section is printed a colored sheet to be used when ordering tickets in advance. Specify preferences on this sheet and mail to the executive office. Careful attention to instructions will ensure the correct filling of your requests. *Since number of tickets for each course is limited, be sure to list second and third preferences for each period in case first preference is already sold out. In every case, effort will be made to furnish first choices.*

If you are requesting registration in the continuous courses, please specify preferences for individual courses as substitutes in order to avoid disappointment should the continuous courses which you select be sold out when your order is received.

Acknowledgment of Advance Order

As soon as an advance order is filled, a postcard, listing the courses that have been reserved for him, will be mailed to the subscriber. Please do not ask to change courses after your order has been filled. The postcard is merely an assurance that your order has been filled; it is not necessary for registration at the Academy meeting.

Claiming Instruction Tickets

No tickets will be sent through the mails. Members who have ordered instruction course tickets will register at the *Advance Order Section* of the Registration Desk during the week of the Convention to secure registration badge, tickets, and all convention material.

Tickets will be on sale during the meeting in Room 805, Eighth Floor, of the headquarters hotel.

KEY TO DESIGNATION OF PERIODS

The periods will be designated with the following key: Select tickets for — Otolaryngology, forenoons, periods 1-2-3 — Ophthalmology, afternoons, periods 4-5-6

Day	(M)onday	(T)uesday	(W)ednesday	(Th)ursday
Period a.m.		1 2 3	1 2 3	1 2 3
Period p.m.	4 5 6	4 5 6	4 5 6	4 5 6

M-4	2:00 p.m. to 3:00 p.m.	W-4	2:00 p.m. to 3:00 p.m.
M-5	3:15 p.m. to 4:15 p.m.	W-5	3:15 p.m. to 4:15 p.m.
M-6	4:30 p.m. to 5:30 p.m.	W-6	4:30 p.m. to 5:30 p.m.
T-1	9:00 a.m. to 10:00 a.m.	Th-1	9:00 a.m. to 10:00 a.m.
T-2	10:15 a.m. to 11:15 a.m.	Th-2	10:15 a.m. to 11:15 a.m.
T-3	11:30 a.m. to 12:30 p.m.	Th-3	11:30 a.m. to 12:30 p.m.
T-4	2:00 p.m. to 3:00 p.m.	Th-4	2:00 p.m. to 3:00 p.m.
T-5	3:15 p.m. to 4:15 p.m.	Th-5	3:15 p.m. to 4:15 p.m.
T-6	4:30 p.m. to 5:30 p.m.	Th-6	4:30 p.m. to 5:30 p.m.
W-1	9:00 a.m. to 10:00 a.m.		
W-2	10:15 a.m. to 11:15 a.m.		
W-3	11:30 a.m. to 12:30 p.m.		

(Familiarity with this key will be helpful and will avoid confusion)

1954

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE 1

Room 8 A — Periods W-4, Th-4

JOSEPH E. ALFANO, M.D.
Chicago, Ill.

Internal Carotid Artery in Ophthalmology

A two-period course—$4.00

A lecture with diagrams and slides demonstrating pertinent anatomy, physiology and ocular aspects of pathologic conditions affecting internal carotid arteries, including congenital anomalies, thrombosis (spontantous, traumatic), supraclinoid aneurysms (berry, saccular, fusiform), infraclinoid aneurysms (cavernous sinus), carotid-cavernous sinus fistulas, as well as aneurysms affecting the branches of the internal carotid in the circle of Willis, including anterior and posterior cerebral and communicating vessels and middle cerebral artery.

Diagnosis of these conditions from their signs and symptoms, radiographically and by angiography. Angiography, technic, contrast media, normal angiogram, angiograms demonstrating carotid system pathology, ocular and systemic complications and treatment of ocular complications will be discussed. Presentation of differential diagnosis of carotid pathology from other cerebral conditions producing similar ocular symptoms.

Also, differential diagnosis of pulsating exophthalmos. Treatment for carotid aneurysms. Ocular and systemic complications following carotid ligation and their management and the fate of the ophthalmic circulation.

COURSE 2

Room 806 — Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

JAMES H. ALLEN, M.D., et al.

Bacteriology and Infectious Diseases of the Eye

An eight-period course—$16.00

The first hour of the course will be devoted to bacteriology and methods of etiologic diagnosis of infectious diseases. Six hours will be devoted to the clinical manifestations and differential diagnosis of infectious and allergic diseases of the eye, and one hour will be devoted to a general summary of the therapy of infectious diseases.

M-4—Bacteriology
James H. Allen, M.D.
New Orleans, La.

M-5—Infections of the Lids and Lacrimal Apparatus
Hugh Ormsby, M.D.
Toronto, Ont., Canada
BY INVITATION

T-4—Bacterial Infections of the Conjunctiva
Isadore Givner, M.D.
New York, N. Y.

T-5—Allergic Diseases of the Lids, Conjunctiva, and Cornea
Frederick H. Theodore, M.D.
New York, N. Y.

W-4—Infectious Diseases of the Cornea
Trygve Gundersen, M.D.
Boston, Mass.

W-5—Virus Infections of the Lids and Conjunctiva
Phillips Thygeson, M.D.
San Jose, Calif.

Th-4—Infections of the Orbit and Globe (to include surgical infections)
Henry Allen, M.D.
Boston, Mass.

Th-5—Therapy of Infectious Diseases
Alson E. Braley, M.D.
Iowa City, Iowa

COURSE 3

Room 8 A — Periods M-4, M-5

KARL W. ASCHER, M.D.
Cincinnati, Ohio

Aqueous Veins in Glaucoma

A two-period course—$4.00

Recent microanatomic and clinical investigations have confirmed the assumption (1941) that the aqueous veins originate (directly or through communicating branches) from outlets of the canal of Schlemm. Originating in or near the limbus the aqueous veins form, together with the canal, a physiologic unit of common origin and of physiologic and clinical significance.

Mathematical evaluation elucidates the pressure gradients, resistance to outflow, and fluid output of normal and of glaucomatous eyes. In both, aqueous veins are found, less readily in eyes with inveterate glaucoma. They are rare in eyes suffering from hydrophthalmos and buphthalmos.

Intravascular pressure in aqueous veins of glaucomatous eyes is lower than in aqueous veins of eyes with normal pressure, and it is subject to diurnal variations, as is also the amount of aqueous humor. Premonitory signs of decompensation may be detected in aqueous veins. Biomicroscopically visible pulsations are less frequent in aqueous veins of glaucomatous eyes than of eyes with normal pressure. Miotics increase the clear fluid content of aqueous veins in normal-pressure and in glaucomatous eyes. After successful surgery, formerly invisible aqueous veins may appear; postoperative hypotony may efface previously visible aqueous veins. The results of compression and dye-injection experiments in normal-pressure eyes differ from those performed on glaucomatous eyes. The aqueous veins have not as yet offered a clinically useful glaucoma test, but the pathogenesis of chronic simple glaucoma may be at least partly explained by study of the outlets of the canal of Schlemmn and the aqueous veins.

COURSE 4

Room 814 Periods M-4, T-4, W-4, Th-4

ARTHUR J. BEDELL, M.D.
Albany, N. Y.

Medical Ophthalmoscopy

A four-period course—$8.00

A review of the common and rare fundus lesions. A demonstration of more than 600 kodachrome fundus photographs. Hypertension, diabetes, nephritis, tuberculosis, syphilis, the blood states, increased orbital and intracranial pressure as evidenced by papilledema, optic neuritis of various types, and the optic atrophies will be presented and discussed.

COURSE 5

Room 8 R Periods M-6, T-6, W-6, Th-6

MILTON L. BERLINER, M.D.
New York, N. Y.

Slit Lamp Microscopy: Advanced Technics

A four-period course—$8.00

The purpose of this course is to review the different methods of illumination and to show their practical application in the observation of normal and pathologic findings. To be considered among these are scatter, direct focal, retroillumination, and specular reflection. A rapid method for the systematic examination of the eye by these methods is explained. Appliances and technics for the biomicroscopic examination of the deeper vitreous and fundus will be demonstrated and discussed. Also to be stressed is the importance of examination of preoperative and postoperative cases by these methods. Numerous lantern slides will be used to illustrate special clinical entities. Newer conceptions of lens changes (cataracts) and vitreous alterations will be presented.

COURSE 6

Room 8 A Periods T-4, T-5

HENRY L. BIRGE, M.D.
Hartford, Conn.
and
CHARLES M. BARBOUR, M.D.
CLAIR RANKIN, M.D.
Hartford, Conn.
BY INVITATION

New Theories of Vascular Disease

A two-period course—$4.00

We are primarily interested in the application of new theories of blood volume study to (1) retinal venous thromboses, (2) cerebral thromboses, (3) surgical hyphemiae and other bleeding, (4) expulsive choroidal hemorrhage, (5) exacerbations of diabetic retinal hemorrhages, (6) anesthetic risks in geriatric surgery and (7) proper preoperative preparation in all eye surgery.

While polycythemia has long been known to cause retinal hemorrhages, the true importance of this condition has been lost sight of, and it has been relegated to a position far below that which it should occupy. The point we wish to make is that the more frequent use of more accurate laboratory methods to indicate the true quantity and quality of the blood elemnts will add a great deal of value to the practice of ophthalmology and many other specialties. The availablity of these procedures no longer permits us to be unaware of the importance of abnormalities in the blood elements.

Retinal venous thrombosis occurring in patients beyond middle life may often be attributed to an excess of red blood cells or a mild form of polycythemia. Blood volume examinations are detailed laboratory procedures in which the ratios of the various blood components are estimated accurately.

It is logical to suppose that a retardation of the blood flow through the smaller vessels of the retina may predispose to thromboses. In cases in which only one branch of the central retinal vein is affected, the outcome has been satisfactory in that the vision has returned to normal following a reduction

of the polycythemia to normal. When massive thrombosis takes place in the retina, the outcome is never satisfactory. Complications, such as diabetes, adversely affect the outcome.

Ophthalmologists must realize that not only polycythemia vera but also transient, relative states of polycythemia may contribute to thromboses that effect the visual organs.

The commonest causes of retinal thrombosis are inflammation, tuberculosis, syphilis, and a focal infection. The possible etiologic factors include infection (direct or focal), neoplasm, surgery, cardiac decompensation, trauma, arteriosclerosis, diabetes, hypertension, glaucoma or polycythemia.

An amazing complication of cataract surgery is the hyphemia that occurs in from 5 to 30 per cent of cases, variations depending on the surgeon.

Many factors have been blamed, but the most likely one, if trauma is eliminated, is a vascular engorgement and excess of blood, or polycythemia.

The relation between excesses of blood volume and all forms of hemorrhage and thrombosis makes it probable that some cases of expulsive choroidal hemorrhage are caused by unrecognized polycythemic states. More attention to blood volume studies should decrease the chances of this tragic complication.

COURSE 7

Room 8 C — Periods M-4, M-5

PAUL BOEDER, Ph.D.
Southbridge, Mass.

Practical Optics for the Ophthalmologist

A two-period course—$4.00

The optical principles of all types of bifocal and multifocal lenses will be discussed; in particular, their prismatic effects, such as object displacement, image jump, vertical imbalances, and decentration. This will be followed by a discussion of cataract and telescopic lenses, and, finally, by a review of the optical principles of retinoscopy, and direct and indirect ophthalmoscopy.

COURSE 8

Room 8 C — Periods T-4, T-5

PAUL BOEDER, Ph.D.
Southbridge, Mass.

Aniseikonia and Space Eikonometry: Practical Application

A two-period course—$4.00

First, a brief review of aniseikonia is given, including a discussion of causes, symptoms, incidence, iseikonic lenses and clinical results.

Then, the effects of aniseikonia on binocular space perception are explained, demonstrated and developed into the principles of space eikonometry.

Finally, the space eikonometer and methods of measurement are described and demonstrated, and an opportunity is given for actual practice of these methods with the latest instrument.

COURSE 9

Room 8 G — Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

HAROLD W. BROWN, M.D., et al.

Eye Muscles

An eight-period course—$16.00

M-4 & 5—Physiology and Pathology of the Ocular Muscles

Harold W. Brown, M.D.
New York, N. Y.

The physiologic action of the individual muscles, conjugate and disjunctive movements (convergence, divergence) will be discussed and illustrated. From these normal physiologic acts, the pathologic variations are developed and classified. Various methods of diagnosis, measurements of deviation and the surgical and nonsurgical correction of these deviations will be presented.

T-4 & 5—Congenital Anomalies

Rudolf Aebli, M.D.
New York, N. Y.

The subject matter will cover the more usual congenital anomalies such as retraction syndrome and its variations, strabismus fixus, Marcus Gunn jaw winking syndrome, paralyses of both elevators of one eye with true and pseudoptosis, and also congenital individual muscle anomalies. Differential diagnosis and treatment, if any, will be discussed.

W-4—Tests

Harold W. Brown, M.D.

Tests in common use will be briefly described and the relative merits discussed. Emphasis will be placed on the screen cover test and its modifications. A practical routine muscle test will be outlined and the technic of the various procedures will be described in detail.

W-5—Surgical Technics in the Management of Motor Anomalies

William B. Clark, M.D.
New Orleans, La.

A thorough understanding of the anatomy and physiology of the ocular muscles is essential before an effective technic in the surgical treatment of motor anomalies can be perfected. A discussion of the dissection of tissues in layers, the preservation of Tenon's capsule covering the muscle, the severing of check and lateral ligaments, the use of suture materials for reattaching muscles to the sclera, and closure of the wounds will be discussed in detail.

Th-4 & 5 — Surgery of the Extraocular Muscles

Harold W. Brown, M.D.
and
Rudolf Aebli, M.D.

The indications and contraindications for surgical correction of heterophoria and heterotropia will be discussed. Special emphasis will be placed on the methods used in selecting the proper muscle or muscles to be operated on and the amount of correction that can be expected from the different types of surgical procedures.

COURSE 11

Room 8 R — Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

ALSTON CALLAHAN, M.D., et al.

Ophthalmic Plastic Surgery:

Advanced Course

An eight-period course—$16.00

Reconstruction of Lids, Lower, Upper; Both Partial and Total Canthoplasty and Epicanthus, Phimosis

Dean C. Hartman, M.D.
Los Angeles, Calif.

Exenteration, Tumors of and Around the Canthus, Various Approaches for Removal of Tumors. Lacrimal Apparatus

Charles Grant, M.D.
Birmingham, Ala.

Recurrent Pterygium, Loss of Lower Fornix, Socket Reconstruction and Symblepharon

J. Gordon Cole, M.D.
New York, N. Y.

Enucleation, Evisceration, Motility Implants, Retraction of Upper Lid After Enucleation, Severe Vernal Catarrh. Newest Treatment for Chemical and Thermal Burns

Merrill Reeh, M.D.
Portland, Ore.

Advanced Ectropion and Entropion Complications of Ptosis Surgery. Orbital Reconstruction

Alston Callahan, M.D.
Birmingham, Ala.

COURSE 12

Room 8 F — Periods M-4, M-5

ROBERT R. CHACE, M.D.
Bronxville, N. Y.
and
COL. AUSTIN LOWREY, JR., (MC)
Honolulu, Hawaii

Ocular Malingering

A two-period course—$4.00

This course presents a survey of ocular malingering from all aspects. The relationship of malingering to hysteria and mental illness is considered. A wide variety of tests are presented, some requiring only the regular apparatus found in the refraction room, others requiring special apparatus. Demonstrations are given of representative tests and time is allowed to permit the examination of equipment by the group taking the course. Questions and discussions from the floor are welcomed.

COURSE 13

Room 8 H — Periods M-4, M-5

WILLIAM B. CLARK, M.D.
New Orleans, La.

Surgery of Ocular Muscles

A two-period course—$4.00

A review of the surgical anatomy and the physiology of the ocular muscles will be presented. Effort will be made to rationalize the use of certain procedures with the anatomy and physiology of the eye muscles. The selection of the type of procedure to plan to follow for certain anomalies will be discussed along with the preliminary preparation of the patient for surgery, the choice of the anesthetic agent, and the postoperative care of the patient.

COURSE 14

Room 8 H — Periods T-4, T-5

EDMOND L. COOPER, M.D.

Detroit, Mich.

Accommodative Esotropia

A two-period course—$4.00

The first hour of this course will deal chiefly with the basic physiology surrounding the etiology of accommodative esotropia. Proper diagnosis and treatment of the condition depends on an adequate understanding of its cause. Of great importance in this regard is the accommodation-convergence relationship, which will be discussed in detail.

The second hour will be devoted to diagnosis and treatment. Most cases do not develop until the age of 3 or 4 years, or later, when an adequate evaluation of the case can be made. Methods of refraction and prescription of glasses will be discussed, and emphasis will be placed on the methods of determining when bifocal glasses are indicated. Finally, the proper technic of helping the patient dissociate accommodation and convergence will be discussed.

COURSE 15

Room 821 — Periods M-4, M-5, T-4, T-5

COURSE 16

Room 821 — Periods W-4, W-5, Th-4, Th-5

JACK C. COPELAND

Chicago, Ill.

BY INVITATION

Streak Retinoscopy

A four-period course—$8.00

This four-hour course is being presented twice, as Course 15 on Monday and Tuesday and as Course 16 on Wednesday and Thursday. **Please select course number according to days on which you wish to attend.**

The following outline describes the steps of the demonstration.

1. Determination of the neutral point.
2. Revealing low astigmatic errors.
3. Locating the zone of the astigmatic band.
4. Determining the power of the cylinder.
5. Estimating the type and degree of error without lenses.
6. "Guide Angle" technic, in refining axis position.
7. Plus cylinder procedure.

COURSE 17

Room 801 — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

FRANK D. COSTENBADER, M.D., et al.

Comitant Strabismus:

Physiology and Management

A twelve-period course—$24.00

This course is designed to teach the why of strabismus, as well as the what to do for strabismus. The "rule of reason" is emphasized rather than the "rule of thumb."

The order of listing of the lectures makes evident our intent to show (1) how eyes may align and see together, (2) what happens when they can no longer see together and, finally, (3) what can be done to restore them to as nearly normal function as possible.

M-4—Binocular Positions and Movements

Marshall M. Parks, M.D.
Washington, D.C.

Movements eyes make and why; positions they assume and why; the reflexes controlling these movements and positions.

M-5—Binocular Vision

Hermann M. Burian, M.D.
Iowa City, Iowa

Physiologic basis of normal binocular vision; conditions necessary for its achievement.

M-6—Dissociation and Binocular Adaptations

Frank D. Costenbader, M.D.
Washington, D.C.

What factors interrupt binocular vision; the sensory and motor adaptations to this interruption.

T-4—Sensory Adaptations

Hermann M. Burian, M.D.

Suppression, amblyopia ex anopsia, anomalous correspondence; their essence and treatment.

T-5—Accommodation-Convergence

Marshall M. Parks, M.D.

Methods of determination and norms of accommodation and convergence. The relationship of accommodation and convergence; the method by which this relationship is measured, and norms for this relationship.

T-6—Diagnostic Principles

Dan G. Albert, M.D.
Washington, D.C.
BY INVITATION

Principles underlying the tests to determine status of motor and sensory cooperation of the eyes. The essence of the various tests.

W-4—Diagnostic Technics

Dan G. Albert, M.D.

How the tests for motor and sensory cooperation of the eyes should be performed and how variations in technic affect the result obtained.

W-5—Therapeutic Principles and Methods

Frank D. Costenbader, M.D.

The methods of achieving the goals of (1) good vision, (2) good alignment, and (3) good binocular vision.

W-6 & Th-4—Exotropia

Frank D. Costenbader, M.D.

The recognition and management of (1) convergence insufficiency, (2) intermittent exotropia, and (3) constant exotropia.

Th-5 & 6—Esotropia

Marshall M. Parks, M.D.

The recognition and management of (1) intermittent and (2) constant esotropia.

Throughout the course, diagnostic and therapeutic technics will be demonstrated and discussed, and illustrative cases will be cited.

COURSE 18

Room 8 T — Periods W-4, W-5

COURSE 19

Room 8 T — Periods Th-4, Th-5

A. GERARD DE VOE, M.D.
New York, N. Y.

Clinical Application of Gonioscopy

A two-period course—$4.00

This two-hour course is being presented twice, as Course 18 on Wednesday and as Course 19 on Thursday. **Please select course number according to day on which you wish to attend.**

This course will review the fundamentals of gonioscopy as well as controversial points.

Anatomy and instrumentation will be described in detail. Attention will then be directed to important clinical conditions in which gonioscopy may be of value. These include injuries, all types of glaucoma, uveitis, tumors, congenital anomalies, preoperative and postoperative examination of certain eyes.

COURSE 20

Room 803 — Periods M-4, T-4, W-4

JOHN H. DUNNINGTON, M.D.
GRAHAM CLARK, M.D.
New York, N. Y.

Retinal Detachment

A three-period course—$6.00

Important factors in the diagnosis and the surgical technics in the treatment of retinal detachment, with special attention to prognostic signs and the effects of the various electrical currents employed, will be discussed.

COURSE 21

Room 803 — Periods M-5, T-5, W-5

WALTER H. FINK, M.D.
Minneapolis, Minn.

Management of Oblique Muscle Problems

A three-period course—$6.00

The presentation will be divided into two parts:

I. Management of superior oblique problems
II. Management of inferior oblique problems

Each part will be considered under the following headings:

A. Importance of the defect as an obstacle to binocular action
B. Diagnostic criteria
C. Principles involved in management
D. Anatomical factors which determine the surgical technic (muscle-insertion-adjacent structures)
E. Effective surgical procedures
F. Present status of problem

Current opinion and personal experience will be considered. Cases will be cited to illustrate points discussed.

COURSE 22

Room 8 T — Periods M-4, M-5

JONAS S. FRIEDENWALD, M.D.
Baltimore, Md.
and
BERNARD BECKER, M.D.
St. Louis, Mo.
BY INVITATION

Studies in Aqueous Flow

A two-period course—$4.00

I. Estimation of Aqueous Flow by Tonography.

An analysis will be given of the sources of error in tonography and of the limits of accuracy in the present procedure.

II. Estimation of Aqueous Flow by Fluorescein Turnover

The general problem of estimating aqueous flow from the turnover of some test substance injected intravenously will be discussed. The limits of accuracy of the presently available procedures will be indicated.

COURSE 23

Room 8 T Periods M-6, T-6, W-6, Th-6

DAN M. GORDON, M.D.
New York, N. Y.

Practical Perimetry

A four-period course—$8.00

A four-hour course devoted to the technic and interpretation of perimetry. There will be numerous slides illustrating the various phases of perimetry. All discussions will be kept at a practical level, stressing clinical application.

COURSE 24

Room 8 K Periods M-4, T-4, W-4

GEORGE P. GUIBOR, M.D.
Chicago, Ill.

Orthoptics: Office and Home Technics

A three-period course—$6.00

The first hour will include the presentation of those patients with motor defects who will be aided by nonsurgical treatment. Among these will be infants with types of esotropia, insufficiencies of fixation ability, pseudopalsy, head tilting, nystagmus, spasmus fixus, and spasmus nutans. Treatment of these patients is often deferred until contractures result, whereas early treatment prevents such motor defects and develops visual acuity.

The second hour will include treatment of patients with eccentric fixation, paralytic deviations, especially those with abducens palsies, and those with accommodative esotropia, and amblyopia. Children with difficulty in reading are often presented to the oculist for his opinion. Practical office and home treatment to overcome these defects will be presented.

In the third hour the course will include diagnosis of those adults with complaints of headaches, aching of the eyes, convergence difficulties, ciliary disturbances, and oscillopsia. Treatment to overcome these complaints will be suggested. Some refractive problems associated with this group will be discussed. Case reports by members of the class will be reviewed.

COURSE 25

Room 8 K Periods M-5, T-5, W-5

JOHN WOODWORTH HENDERSON, M.D.
Ann Arbor, Mich.

Neuro-ophthalmology

A three-period course—$6.00

Practical application of the anatomy of the visual pathway will be presented by means of case studies during the first half of the course. This will be followed by a review of the oculomotor pathways, discussing the effects of lesions at various neurologic levels of control. Certain cases of impairment of motility will be demonstrated by means of motion pictures. During the final period a review of the major neurologic syndromes which include ocular abnormalities will be presented.

COURSE 26

Room 8 H Periods W-4, W-5

ROBERT W. HOLLENHORST, M.D.
Rochester, Minn.

Arterial Diseases as They Affect the Eye

A two-period course—$4.00

Lesions of the retinal arterioles are commonly seen in the presence of hypertensive cardiovascular disease. Thrombotic and embolic phenomena accompany several disease entities. Kodachrome fundus photographs of the retinal arterioles will illustrate the changes seen in vascular hypertension, cardiac lesions, central artery occlusions, periarteritis nodosa, cranial arteritis, and other conditions to be discussed.

COURSE 27

Room 8 M Periods M-5, M-6

W. HENRY HOLLINSHEAD, Ph.D.

Rochester, Minn.
BY INVITATION

Anatomy of the Orbit

A two-period course—$4.00

The fascias, muscles, nerves and vessels of the orbit, including the anatomy of the eyelids, are discussed and illustrated in some detail. General features and specific points

are illustrated diagrammatically by lantern slides, and the various important structures as they actually appear in a careful gross dissection of the orbit (vessels and nerves having been painted) are shown in a colored moving picture. In the latter, the orbit is dissected both from in front, and from above after removal of the orbital roof.

COURSE 28

Room 807 Periods M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6

WENDELL L. HUGHES, M.D., et al.

Ophthalmic Plastic Surgery: Fundamental Course

An eight-period course—$16.00

This course will be given by the following collaborators and will cover fundamental procedures, technics, dressings, instruments, etc. It is designed to give greater detail in the fundamentals and principles of plastic surgery than is possible in the course given by Dr. Alston Callahan (Course 11). It is integrated with the course of Dr. Callahan so that the men who take this course this year will get more benefit from the Advanced Course next year. It is suggested that the Fundamental Course be taken in preparation for the Advanced Course. Most of the conditions and cases discussed in the fundamental course are cases that should be handled by almost any well-trained ophthalmologist. The course is limited to the discussion of cases which will be seen for the most part in routine ophthalmological practice.

M-5 & 6—Wendell L. Hughes, M.D.
Hempstead, N. Y.

Pertinent anatomical points, basic surgical principles, choice of tissues and types of grafts, preparation of areas, anesthesia, dressings, postoperative care. Reason for Z-plastic instruments.

T-5—A. Gerard DeVoe, M.D.
New York, N. Y.

Pterygium, pseudopterygium, symblepharon, conjunctivochalasia, choice of treatment for certain lesions, radiation vs. surgery.

T-6—Joseph C. Hill, M.D.
Toronto, Ont., Canada

Laceration not involving lid margin, involving free lid margin, nasal end, temporal end; ectropion and entropion of milder degrees. Trichiasis.

W-5 & 6—Byron Smith, M.D.
New York, N. Y.

Chalazion, blepharochalasia, baggy lids, herniation of orbital fat, enucleation, evisceration with buried implant. Ptosis, congenital paralytic and traumatic, pseudoptosis.

Th-5—Crowell Beard, M.D.
San Jose, Calif.

Lacrimal apparatus; x-ray technic in the orbit; tattooing technics.

Th-6—Panel

COURSE 29

Room 8 V Periods W-4, W-5

FRED W. JOBE
IRVING LUECK
Rochester, N. Y.
BY INVITATION

Ophthalmic Optics: A Laboratory Demonstration

A two-period course—$4.00

This course will be a series of demonstrations and experiments performed by the class to illustrate the basic principles of Ophthalmic and Physiological Optics. The demonstrations and experiments will show what can be done with optics to control and correct the refractive anomalies of vision.

COURSE 30

Room 8 V Periods M-4, M-5

LORAND V. JOHNSON, M.D.
and
ELMER J. BALLINTINE, M.D.
Cleveland, Ohio
BY INVITATION

Clinical Aqueous Tonography

A two-period course—$4.00

Tonography is a method for investigating aqueous humor dynamics which yields information clinically useful in treatment of glaucoma. The method consists in recording continuously for four or five minutes the readings of a Mueller Electronic Tonometer which is resting on the eye. From the resulting curves of tonometer readings two factors can be calculated, one of which (C, "the facility of outflow") measures the ease with which aqueous humor is squeezed out of the eye. The other (F, "the rate of aqueous production") is an indication of the rate at which aqueous humor is being secreted.

During the first part of the course, assumptions on which the calculations are

based will be reviewed. In the second part of the period, the apparatus will be demonstrated on a patient, the curve obtained measured, and the factors calculated. The period will conclude with a discussion of the clinical applications of the measurements and questions relative to material covered.

COURSE 31

Room 8 J — Periods W-4, W-5

COURSE 32

Room 8 J — Periods Th-4, Th-5

DEWEY KATZ, M.D.
Hartford, Conn.

and

MARIE A. JAKUS, Ph.D.
Boston, Mass.
BY INVITATION

Anatomy and Histology: Recent Advances

A two-period course—$4.00

This two-hour course is being presented twice, as Course 31 on Wednesday and as Course 32 on Thursday. **Please select course number according to day on which you wish to attend.**

The first hour of this course will deal with a discussion of the recent advances in our knowledge of the anatomy and histology of the eyeball and the application of this knowledge when a clinical relationship is present. The second hour will be devoted to a presentation of a completely new vista of this subject as revealed by the electron microscope. The use of this instrument in ophthalmic research has already brought out many details of structure which could not previously be resolved. Current work in this field, much of it original (Jakus), will be described. Particular attention will be paid to the fine structure of the cornea.

COURSE 33

Room 809 — Periods M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6

WILLIS S. KNIGHTON, M.D., et al.

Highlights in Glaucoma

An eight-period course—$16.00

A discussion of glaucoma designed to present modern concepts of etiology, classification and management. Basic principles will be outlined, leaving time for the student to participate in a round table discussion.

M-5—Classification and Diagnosis
Willis S. Knighton, M.D.
New York, N. Y.

M-6—Wide Angle Glaucoma
Edwin B. Dunphy, M.D.
Boston, Mass.

T-5—Narrow Angle Glaucoma
Paul A. Chandler, M.D.
Boston, Mass.

T-6—Secondary Glaucoma
A. Gerard De Voe, M.D.
New York, N. Y.

W-5—Pathology
Joseph A. C. Wadsworth, M.D.
New York, N. Y.

W-6—Medication
P. Robb McDonald, M.D.
Philadelphia, Pa.

Th-5—Surgery
Harold G. Scheie, M.D.
Philadelphia, Pa.

Th-6—Round Table Discussion

COURSE 34

Room 8 V — Periods M-6, T-6, Th-5

RALPH I. LLOYD, M.D.
Brooklyn, N. Y.

Macular Lesions

A three-period course—$6.00

Adequate pathology is essential to sound diagnosis. Unless a diseased eye is painful or endangers life or the vision of the other eye, it does not reach the laboratory, leaving an important group with incomplete data. Ophthalmoscopy then becomes the most important means to establish the diagnosis of a group including senile chorioretinal lesions, the hereditary macular degenerations, errors of development, and atypical tumors. The modern hand ophthalmoscope is indispensable but kodachromes and paintings of various stages over an extended period with binocular ophthalmoscopy and the limited pathologic material available, are great helps in difficult cases. Results of the use of all of these means will be offered and preference given to the senile group, hereditary macular degeneration and tumors, after which other less frequently seen types will be discussed as far as time allows.

COURSE 35

Room 819 — Periods M-4, M-5

DONALD J. LYLE, M.D.
Cincinnati, Ohio

Associated Neurologic Lesions Such as Aphasia, Agnosia, and Apraxia

A two-period course—$4.00

During the first hour an animated film will be shown, describing cerebral anatomy, normal function and dysfunction associated with types of aphasia. The film was produced by Dr. J. M. Nielsen. This will be followed by a discussion of types of aphasia concerning ophthalmology with location of lesions and symptoms.

COURSE 36

Room 817 — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

JOHN M. McLEAN, M.D.
New York, N. Y.

JACK S. GUYTON, M.D.
Detroit, Mich.

A. E. MAUMENEE, M.D.
San Francisco, Calif.

Cataract Surgery

A twelve-period course—$24.00

A course on the technic of intracapsular cataract extraction. It includes detailed discussion of preoperative and postoperative management, anesthesia and akinesia, various types of incisions and sutures, management of iris, methods of intracapsular lens delivery, and indications. Operative and postoperative complications. Motion picture and lantern slide demonstrations.

COURSE 37

Room 816 — Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

SAMUEL J. MEYER, M.D., et al.
Glaucoma

An eight-period course—$16.00

The fundamentals of glaucoma will be elaborated upon with considerable emphasis placed on the essentials of the early diagnosis. Both the medical and the surgical treatment will be given in minute detail including the use of the newer drugs that are being tried out both experimentally and clinically. The various newer diagnostic aids as advocated in the recent literature will be given considerable thought.

M-4—The Glaucomas: Definition, Mechanisms, Classifications
Peter C. Kronfeld, M.D.
Chicago, Ill.

M-5—The Hostopathology of Acute and Chronic Glaucoma
Merrill J. Reeh, M.D.
Portland, Ore.

T-4—Wide Angle or Compensated Glaucoma
Samuel J. Meyer, M.D.
Chicago, Ill.

T-5—Narrow Angle Glaucoma
Joseph S. Haas, M.D.
Chicago, Ill.

W-4—Gonioscopy
H. Isabelle McGarry, M.D.
Evanston, Ill.

W-5—Secondary Glaucoma
Wilfred E. Fry, M.D.
Philadelphia, Pa.

Th-4—The Principles of Nonsurgical Treatment of Glaucoma
Irving H. Leopold, M.D.
Philadelphia, Pa.

Th-5—The Principles of Surgical Treatment of Glaucoma
Samuel J. Meyer, M.D.

COURSE 38

Room 8 D — Periods Th-4, Th-5

KENNETH N. OGLE, Ph.D.
Rochester, Minn.
BY INVITATION

Essential Aspects of Binocular Vision

A two-period course—$4.00

These lectures present a well-rounded review not only of the basic physiology and optics involved in normal binocular vision, but also of the existing problems. To be considered are the sensory and motor aspects of the organization of the two eyes, the basic facts of fusion, fusional movements, phorias, fixation disparity, prism vergences, stereopsis, and elements of binocular spatial localization.

COURSE 39

Room 803 — Periods M-6, T-6, W-6

R. TOWNLEY PATON, M.D.
New York, N. Y.

Corneal Surgery

A three-period course—$6.00

During the course the whole subject of keratoplasty will be discussed: indications and contraindications for both penetrating and nonpenetrating types of corneal trans-

plants; therapeutic transplants; operative technic and the necessary instruments for a transplant operation; postoperative complications and how to deal with them; donor material; and statistical results of a large series of cases.

The lectures will be illustrated with slides and motion pictures.

COURSE 40

Room 819 Periods T-4, T-5

RALPH H. PINO, M.D.
Detroit, Mich.
and
D. J. EDWARDS
Chicago, Ill.
BY INVITATION

Problems of Bifocal and Aphakic Lenses

A two-period course—$4.00

Good vision, comfort, and appearance constitute the patient's measure of satisfaction with any form of spectacles. To him a cataract operation is as good as the vision he gets.

The function of an optical system is to guide rays of light into determined pathways. The best ophthalmic lens is that which most nearly accomplishes this. We will place special emphasis on the reading point level and the placement of the optic axis of the lens in as direct a line with the visual axis of the eye as possible. The optic centers as placed on each side of a lens by a lensometer are without meaning except as the ends of the optic axis.

A beam of light passing through a lens except centered through the optic axis develops aberration in proportion as it deviates from this axis, and in proportion to the strength of the lens.

The theory of refraction and what takes place through prisms, spheres, and cylinders is demonstrated by means of an exhibit in plastics and charts designed for educational purposes. It becomes easier to visualize lenses as combinations of prisms and to understand why light passing through prisms bends toward the base. This principle is the essence of refraction.

The course is designed to demonstrate clearly the physics of light and the mechanics of ophthalmic lenses essential to good vision. Understanding these principles, the ophthalmologist is in position to hold manufacturers and opticians responsible in meeting the requirements of his prescriptions. Time and expense are saved, trouble prevented, and good will preserved.

COURSE 41

Room 815 Periods M-5, M-6

DANIEL M. ROLETT, M.D.
White Plains, N. Y.

Practical Application of Gonioscopy

A two-period course—$4.00

This course reviews in detail the instrumentation essential in gonioscopy.

It will consist of individual instruction in the manual use of the various gonioscopes in use at present: Goldmann's, Allen's, Colenbrander's and others, their advantages and disadvantages. The course will emphasize the normal anatomy of the angle, thereby arousing instantaneous awareness of pathology whenever present.

The use of the gonioscope is stressed in (a) all injuries of the eyes, whether perforating or contusive; (b) glaucoma, all types, preoperative and postoperative; (c) congenital anomalies; and (d) inflammatory conditions of the anterior segment of the eye.

COURSE 42

Room 811 Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

HUNTER H. ROMAINE, M.D., et al.

Ocular Motility

A twelve-period course—$24.00

It is our desire to cover the subject, starting with the fundamentals and working through to surgical technics and an evaluation of all methods of treatment.

M-4—Applied Anatomy and Physiology of the Ocular Muscles

Hunter H. Romaine, M.D.
New York, N. Y.

Anatomy and physiology of the ocular muscles will be presented, bringing out the relationship of the anatomy and physiology to the pathologic situations that result from discrepancies in the motor system.

M-5—Etiologic Factors in Muscular Imbalance

Abraham Schlossman, M.D.
New York, N. Y.

M-6—Evaluation of Tests in the Diagnosis of Motor Anomalies

Edward A. Dunlap, M.D.
New York, N. Y.

T-4—Preoperative Orthoptic Routine and Therapy

Dorothy Parkhill
New York, N. Y.
BY INVITATION

Preoperative orthoptic routine will be outlined and also methods used when operative procedure is not contemplated.

T-5—Indications and Contraindications for Surgical Intervention

Hunter H. Romaine, M.D.

T-6—Round Table Discussion—Panel

W-4—Choice of Surgical Procedure

Byron Smith, M.D.
New York, N. Y.

W-5—Surgical Technic

Truman L. Boyes, M.D.
New York, N. Y.

An evaluation of the various surgical technics will be made, including discussion of sutures and surgical materials.

W-6—Surgical Complications and Secondary Surgery

Hunter H. Romaine, M.D.

Th-4—Analysis of Operative Results and Evaluation of Surgical Versus Nonsurgical Therapy

Richard C. Troutman, M.D.
New York, N. Y.

Th-5—Postoperative Orthroptic Routine and Therapy

Dorothy Parkhill

Th-6—Home Training in Orthoptics

Hunter H. Romaine, M.D.

COURSE 43

Room 8 J Periods M-6, T-6, W-6

THEODORE E. SANDERS, M.D.
St. Louis, Mo.

GLEN GIBSON, M.D.
Philadelphia, Pa.

BERNARD BECKER, M.D.
St. Louis, Mo.
BY INVITATION

Vascular Disease

A three-period course—$6.00

This course on vascular disease of the eye is designed to give a thorough understanding of this group of diseases by attempting to correlate the clinical ophthalmoscopic appearance with the underlying pathologic lesions in relation to the possible etiology and pathogenesis.

The three hours will be definitely integrated. The first hour (Sanders) will consist of a review of the anatomic peculiarities of the intraocular circulation, a classification of intraocular vascular disease and a discussion of the pathologic nature of the various types. The second hour (Gibson) will be a correlation of the ophthalmoscopic lesion with the pathologic background by a description of the ophthalmoscopic pictures of the various disease entities. The third hour (Becker) will cover the present status of knowledge of the pathogenesis of some of these lesions, and the possible suggestions for clinical management.

COURSE 44

Room 8 J Periods M-4, M-5

ROBERT A. SCHIMEK, M.D.
FRANKLYN BOUSQUET, M.D.
Detroit, Mich.
BY INVITATION

Gonioscopy and Aqueous Outflow Determinations

A two-period course—$4.00

During the first hour, human subjects will be utilized for demonstrations of (a) the use of various gonioprisms for visualizing the chamber angle and (b) tonographic determination of rates of aqueous outflow.

During the second hour, data collected from a series of patients will be presented. The practical clinical applications of both gonioscopy and aqueous outflow will be correlated and emphasized.

ALBERT E. SLOANE, M.D.
Boston, Mass.

BERNARD C. GETTES, M.D.
Philadelphia, Pa.

ABRAHAM POLLEN, M.D.
Boston, Mass.

Refraction

The following three courses dealing with Refraction, Course 45, Course 46 and Course 47, will be under the direction of Albert E. Sloane, M.D. They may be purchased jointly or separately as your schedule permits.

COURSE 45

Room 8 P Periods M-4, M-5

School Vision Testing:

Program, Problems and Methods
Albert E. Sloane, M.D.

A two-period course—$4.00

This course is designed to provide the ophthalmologist with background for this important phase of public health work. In recent years increasing emphasis is being placed on such programs throughout the country, and the eye doctor is more and more being called in to act either in an advisory capacity or in the actual setting up of such procedures. Various methods of testing will be demonstrated and discussed and their present relative merits described. The many important problems involved in such programs other than actual testing equipment will be discussed.

COURSE 46

Room 8 P — Periods T-4, T-5

Telescopic Lenses and Other Subnormal Vision Aids

Albert E. Sloane, M.D.

A two-period course—$4.00

The subject of telescopic lenses will be reviewed briefly to provide the ophthalmologist with background for appreciating the value and limitations of such lenses. Such tests can be done by the average ophthalmologist and technics will be demonstrated utilizing the various types of lenses on the market today. In addition there will be shown various other aids for increasing the size of the retinal image. Many devices are available which are easily fitted and very inexpensive. The aim of this course is toward clinical application.

COURSE 47

Room 8 P — Periods W-4, W-5

A. Criteria for Prescription of Prisms in Ophthalmic Practice

Abraham Pollen, M.D.

A two-period course—$4.00

Dr. Pollen will attempt to set up a working formula for guidance in prescribing prisms. It is well realized that the standard textbooks justifiably generalize in this phase of treatment. It must be so, since all cases must be considered individually. Nevertheless, some system of guidance is desirable and helpful even if subject to some error. We will stress a classification of heterophoria and indicate in which cases prisms may be prescribed and their strength computed.

B. Drugs Used in Refraction

Bernard C. Gettes, M.D.

The place of cycloplegia in refraction has always been a controversial subject. The advantages and shortcomings will be openly discussed, as will the indications and contraindications. The relative merits of the various cycloplegias and the best methods of administration will be considered. Miotics and their influence and use in accommodative strabismus will be discussed.

COURSE 48

Room 8 P — Periods Th-4, Th-5

M. NOEL STOW, M.D.
L. CONNER MOSS, M.D.

Washington, D. C.

Diagnostic and Therapeutic Office Procedures

A two-period course—$4.00

The usual office routines are established to be sufficiently inclusive to avoid overlooking significant eye pathology. Routines which have been helpful in accomplishing this are discussed. At the same time exhaustive and involved methods which are time-consuming are reserved for the occasions where specifically indicated.

The medical, surgical and traumatic ocular conditions which lend themselves to satisfactory treatment in an office are presented in more detail. Those surgical and therapeutic measures performed in the hospital are omitted, but the postoperative care in the office is given consideration.

COURSE 49

Room 8 F — Periods W-4, W-5

EDWIN FORBES TAIT, M.D.

Norristown, Pa.

Accommodation and Convergence Abnormalities: Practical Methods in Their Correction

A two-period course—$4.00

Accommodation and convergence are motor responses which may be considered in terms of the stimuli which initiate them.

Most accommodation and binocular vision abnormalities are the result of deficiencies in those reflexes. On this basis, therefore, a clinically useful classification of abnormalities is established, affording a rational background for the development of effective orthoptic, refractive, or surgical corrective procedures.

The course will produce practical methods, utilizing these principles and applicable in office practice, for the correction or relief of these ocular abnormalities.

COURSE 50

Room 8 U — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

GEORGIANA D. THEOBALD, M.D., et al.

Histopathology

A twelve-period course—$24.00

The teaching will be by lecture, microprojection and microscopes. Before attending, a review of normal histology is recommended.

Pathology of Retrolental Fibroplasia

Frederick C. Blodi, M.D.
Iowa City, Iowa

The histologic changes in the eyes of prematurely born children with retrolental fibroplasia will be discussed in the basis of kodachromes and histologic slides.

The early changes caused by this disease are characteristic and absolutely pathognomonic. They follow a definite pattern. The first changes occur at the equator in the nerve fiber layer of the retina. Here we see small nests of endothelial cells soon associated with an increase of the glial elements. These nests become canalized and the newformed capillaries break through the internal limiting membrane into the vitreous.

Angiomatous tissue forms on the retina and in the vitreous. The retina becomes edematous and hemorrhages occur. The retina becomes folded and detached by organization and contracture of this new-formed tissue.

In some cases the whole retina will be detached and complications, such as anterior synechias and secondary glaucoma, will follow.

Nonspecific Uveitis

Leonard Christensen, M.D.
Portland, Ore.

Uveitis is an inflammatory reaction of the uveal tract and differs from inflammation elsewhere by the peculiarities of the environment in which it takes place. A brief discussion of the pathogenesis of inflammation will be given along with the sequelae and complications that develop in nongranulomatous uveitis.

Sympathetic ophthalmia and tuberculosis are both granulomatous diseases. Sympathetic ophthalmia is always bilateral and tuberculosis frequently is. Histopathologic differentiation is possible; it requires accurate knowledge of cellular detail; differentiation of the two diseases is good exercise.

Sympathetic ophthalmia represents an infiltrative type of inflammation while tuberculosis is destructive. Tuberculosis tends to have a spotty distribution while sympathetic uveitis is widespread. The granulomatous lesions (tubercles) in the two diseases are also different on histopathologic examination.

Pathology of the Optic Nerve

Windsor S. Davies, M.D.
Detroit, Mich.

Various lesions of the optic nerve will be discussed from the histopathologic standpoint. A correlation will be made between the clinical and pathologic findings.

Pathology of Corneal and Scleral Disease

Levon K. Garron, M.D.
Oakland, Calif.

The pathology of common corneal lesions will be discussed. The healing of penetrating and perforating corneal wounds will be presented together with a discussion of complications. Keratitis, corneal ulceration and their various sequelae will be shown and discussed. A few of the more common degenerative corneal lesions will also be considered. Episcleritis, scleritis, as well as injuries and degeneration of the sclera, will be reviewed.

Pathology of the Choroid and Macular Diseases

Michael J. Hogan, M.D.
San Francisco, Calif.

Pathologic changes in the choroid, excluding neoplasms, will be discussed. The development of specific and nonspecific inflammatory diseases will be presented, including the sequelae. The effects of trauma on the choroid will be discussed. Various circulatory and degenerative lesions will be demonstrated to show the effects on both the choroid and the retina. Hereditary and senile macular degenerative lesions will be depicted.

Pathology of the Lens

Michael J. Hogan, M.D.

The purpose of this lecture will be to present the normal histology of the lens and the methods by which a number of diseases and agents result in the development of cataractous changes. The histopathology will be discussed in detail, giving the changes in the lens capsules, lens epithelium, and the lens fibers. Senile cataract in its various manifestations will be discussed from a clinical and pathologic standpoint. Cataracta complicata of the posterior and anterior types will be demonstrated. Diabetic and metabolic cataracts will be discussed.

Hypertensive, Renal, Diabetic and Arteriosclerotic Retinopathy

A. Ray Irvine, Jr., M.D.
Beverly Hills, Calif.

Celloidin sections of eyes showing the typical changes of hypertensive, renal, diabetic and arteriosclerotic retinopathy will be presented for microscopic study. Where possible, newer stains demonstrating mucoproteins and fixed polysaccharides will be used. The lecture will consist of an explanation of the slide material as well as a discussion of the pertinent pathologic physiology.

Tumors of the Uvea

John S. McGavic, M.D.
Bryn Mawr, Pa.

The histopathology of ocular melanomas and other tumors will be demonstrated by lantern and microscopic slides.

Tumors of the Retina

Edith M. Parkhill, M.D.
Rochester, Minn.
BY INVITATION

The gross and microscopic pathology of retinoblastoma will be presented with the aid of lantern slides. Factors in etiology and prognosis will be considered. On classifying the cases according to certain factors in the history and microscopic findings, one group appears in which the survival rate is almost 100 per cent.

Pathology of Glaucoma

Theodore E. Sanders, M.D.
St. Louis, Mo.

The essential changes produced in the tissues of the eye by increased intraocular pressure will be studied. The various lesions causing secondary glaucoma will also be described. The possible mechanisms which cause both primary and secondary glaucoma will be discussed.

Cells Found in Inflammatory Lesions

Georgiana D. Theobald, M.D.
Oak Park, Ill.

A discussion of cytology, pathology and sequelae of ocular inflammations, in general, will be presented.

Ocular Melanomas

Helenor Campbell Wilder, M.D.
Washington, D. C.

The histopathology of ocular melanomas will be demonstrated by lantern and microscopic slides. Classifications according to cell type, argyrophil fiber content and pigment content will be discussed in detail and correlated with statistical studies of clinical behavior. Theories of histogenesis will be given brief consideration.

COURSE 51

Room 800 — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

HARVEY E. THORPE, M.D.
Pittsburgh, Pa.

ROBERT J. MASTERS, M.D.
Indianapolis, Ind.

ALEXANDER A. KRIEGER, M.D.
Pittsburgh, Pa.

JOHN MELVIN MASTERS, M.D.
Indianapolis, Ind.

SAMUEL N. KEY, JR., M.D.
Austin, Texas

FRED M. WILSON, M.D.
Indianapolis, Ind.

Slit Lamp Biomicroscopy

A twelve-period course—$24.00

This course, which has been presented every year since 1936, was originally planned as an elementary course for those who had used the slit lamp biomicroscope very little or not at all. Much time was given to making the registrants familiar with the manipulation of the instruments. The illustrated lectures, which described biomicroscopic studies of the normal and pathologic cornea, anterior chamber, iris, crystalline lens and vitreous humor, were essentially elementary. However, the more thorough training of ophthalmologists during the past several years has definitely changed the needs of those who register for this course, and the instructors who present it have correspondingly changed its curriculum.

The illustrated lectures have been made more comprehensive, as they cover the original subjects of cornea, anterior chamber, crystalline lens and vitreous humor. There are added lectures on methods of illumination, study of the conjunctiva, slit lamp gonioscopy and study of the deep vitreous humor and eyeground. In the demonstration room we have been privileged to show the new instruments which are being manufactured overseas. The technic of examining the anterior chamber angle, deep vitreous and eyeground is demonstrated daily. Incidentally, the perennially intriguing observation of corneal endothelium in specular reflection is still receiving its share of attention.

Beginners are still as welcome as ever in this course! Some of the teaching group get great satisfaction from guiding the novice through his first steps in the use of this indispensable instrument, and it has been our experience that almost every beginner has developed satisfactory proficiency before our working time is completed.

COURSE 52

Room 8 W — Periods T-4, T-5

HARVEY E. THORPE, M.D.
Pittsburgh, Pa.

Surgery of Intraocular Foreign Bodies

A two-period course—$4.00

This course proposes a comprehensive survey of old established and also newly developed technics for the removal of foreign bodies from the eyeball.

Magnetic and nonmagnetic intraocular foreign bodies create special surgical problems. Accurate determination of functional and anatomic damage is important. Methods of evaluation of extent of trauma to ocular tissues and of impairment of vision will be analyzed.

Localization of foreign bodies by x-ray methods must be accurate for successful surgery. The electroinductive locator is a distinct help in foreign body localization both before and during operation. Several methods of localization, both by x-ray and by electroinductive technic, will be described and elaborated in this course.

The surgical technic of removal of foreign bodies must be properly planned from incision to closure. Technics for removal of foreign bodies from the anterior chamber, iris, lens, ciliary body, vitreous, and retina will be reviewed.

It is also proposed to discuss the management of associated complications, such as, laceration, uveal and vitreous prolapse, traumatic cataract, retinal detachment and infection. A review of preoperative and postoperative care will be included.

COURSE 53

Room 812 — Periods M-5, M-6, T-5, T-6, W-5, W-6

MAYNARD C. WHEELER, M.D.
PHILIP KNAPP, M.D.
New York, N. Y.

Concomitant Strabismus: Diagnosis and Treatment

A six-period course—$12.00

The practical handling of concomitant strabismus will be fully discussed. This will include methods of examination, measurement of the deviation, diagnosis and sensorial evaluation of convergent and divergent strabismus. The medical treatment, the indications for surgery, the choice of operation and the postoperative treatment will be considered in detail.

COURSE 54

Room 8 G — Periods M-6, T-6, W-6

MEYER WIENER, M.D.
Coronado, Calif.

Practical Points in Eye Surgery

A three-period course—$6.00

Elements for making a good eye surgeon will be discussed, such as groundwork, temperament, knowledge of surgical applied anatomy, gaining confidence of patient, artistic imagination (especially for plastic repair), and experience in animal surgery.

All-inclusive coverage of the various methods for each and every procedure will not be attempted. Only those chosen through personal experience whose results have proven best will be included. In discussing the steps in these particular ones it may be necessary to touch on some of the most popular methods in order to explain the reasons for not recommending these in preference to the methods chosen.

An attempt will be made to describe, in detail, particular steps of procedure, the proper use of which may make for success or failure of the operation. These shall include operations for cataract, glaucoma, plastic repair, operations on the cornea, lids, muscles and socket.

INDIVIDUAL COURSES — OPHTHALMOLOGY

COURSE 201

Room 8 M Period M-4 or T-4

C. KNIGHT ALDRICH, M.D.
Minneapolis, Minn.
BY INVITATION

Psychosomatic Medicine in Ophthalmology

1. General principles of psychosomatic interrelationships
2. Conversion symptoms, such as hysterical blindness
3. Psychosomatic illness, using glaucoma as an example
4. Emotional reactions to organic disease, including problems of rehabilitation of the blind
5. The eyes in psychosis
6. Treatment
   a. Supportive treatment by the ophthalmologist
   b. Problems of referral to the psychiatrist

COURSE 202

Room 806 Period M-6 or T-6

MOACYR E. ALVARO, M.D.
Sao Paulo, Brazil

Uveitis: Etiology and Treatment

The various types of uveitis will be discussed, but chronic endogenous uveitis of the granulomatous and nongranulomatous type will be dealt with in greater detail.

The clinical diagnosis of uveitis is always easy, but it is not always possible to find out from the ocular symptoms whether the uveitis is of the granulomatous type or not, in spite of the fact that there are definite clinical symptoms for each of these types. The subjective and objective symptoms of both types of uveitis will be discussed.

COURSE 203

Room 812 Period M-4 or T-4

BENNETT Y. ALVIS, M.D.
St. Louis, Mo.

End Results of Various Types of Cataract Wound Closure

Effective closure of the cataract wound demands exact approximation of the wound margins and security against reopening. There are several factors involved, each subject to many variations. The discussion will touch these points.

The Incision: its position, extent, bevel and manner made.

Sutures for securing the wound against reopening. The various types will be evaluated in the light of experience and reported studies.

Devices for sealing the wound against leaking are the conjunctival flaps and the use of fibrincoagulum. Existing evidence concerning the use of the different types of these will be reviewed.

Complications of cataract surgery, such as hemorrhage, vitreous loss, postoperative glaucoma, and iris prolapse, and measures for avoiding them will be considered.

The effects of the various features of wound closure on clinical results are to be considered.

COURSE 204

Room 807 Period M-4 or T-4

WALTER S. ATKINSON, M.D.
Watertown, N. Y.

Anesthesia in Ophthalmology

Preanesthetic Preparation and Medication
Anesthetic Agents Used for Topical, Infiltration, and Block Anesthesia
The Technic Used to Produce Complete Anesthesia and Akinesia
Anesthetic Emergencies

COURSE 205

Room 809 Period T-4 or W-4

GEORGE S. BAKER, M.D.
Rochester, Minn.
BY INVITATION

Painful Neuralgias of the Head: Treatment

The term "neuralgia" has been in clinical usage for centuries. By definition neuralgia is a sharp, intermittent pain in the distribution of a given nerve without apparent cause. Our conception may change a bit during modern times when a careful neurologic or anatomic study of the case leads one to suspect that the neuralgia may be produced by some organic lesion; namely, inflammatory, metabolic, vascular, toxic or structural defect. It is true that such causes as aneurysms, localized infections and tumors have been repeatedly described as the etiologic factor in one or the other forms of major tic douloureux. Sometimes by way of an introspective psychiatric evaluation ample reasons for the so-called idiopathic pain seem well established. Whenever the cause is clear to the physician, the treatment is

obviously more successful for the patient.

The differential diagnosis and the neurosurgical treatment of the major and minor neuralgias of the head will be demonstrated from a clinical point of view. Specially prepared lantern slides and colored motion pictures will be used to emphasize the close relationship of these conditions to diseases of the eye, ear, nose and throat.

COURSE 206

Room 4 A — Period M-4

OTTO BARKAN, M.D.
San Francisco, Calif.

Congenital Glaucoma: Diagnosis and Treatment

Corneal cloudiness, injection of the bulbar conjunctiva, increased lacrimation or blepharospasm should lead to the suspicion of glaucoma even though no enlargement of the eye has occurred. In view of the urgency of early operation, the tension should be tested with a tonometer under ether anesthesia, preferably intratracheally. There should be complete relaxation at the moment the tension is taken. Once the diagnosis is established, 5 per cent prostigmine should be instilled every three hours and goniotomy performed as soon as possible. Denuding the cloudy epithelium of the cornea makes the operation under gonioscopic control possible in over 90 per cent of cases. The present simplified technic of goniotomy is described.

COURSE 207

Room 4 A — Period W-4

CONRAD BERENS, M.D.
New York, N. Y.

Cyclodiathermy, Iridencleisis, and Cyclodialysis

The statistical evaluation of a surgical procedure is of value, particularly in glaucoma, when the data contains (1) control of tension within normal limits without the use of miotics, (2) satisfactory control of tension with miotics, (3) the increase or preservation of the preoperative visual acuity postoperatively, (4) the increase or preservation of the preoperative visual fields postoperatively and (5) the evaluation of immediate and long range postoperative complications. Material containing these data will be presented.

The indications, contraindications, technic and the evaluation of the operative results and complications of cyclociliary and retrociliary electrolysis and diathermy, iridencleisis and cyclodialysis will be presented in cases observed from one to ten years.

COURSE 208

Room 4 A — Period W-6

RAYNOLD N. BERKE, M.D.
Hackensack, N. J.

Surgery of Oblique Muscles

This subject is important in the surgical correction of the vertical extraocular muscle anomalies because the oblique muscles are primarily or secondarily involved in every case of hypertropia. Therefore, every ophthalmic surgeon should be familiar with the indications and the surgical technic for these operations.

Slides and motion pictures will be shown illustrating these points.

COURSE 209

Room 808 — Period M-4 or T-4

JEROME W. BETTMAN, M.D.
San Francisco, Calif.

Value of Goniotomies

Goniotomy is one of the great surgical advances in modern ophthalmology. It has already saved many from a life of total blindness.

The diagnosis, differential diagnosis, and prognosis of congenital glaucoma will be reviewed. Evidence will be presented to demonstrate that goniotomy is the procedure of choice in congenital glaucoma, and the mode of action will be explained. Each of the modern technics of goniotomy will be presented. The operation of goniotomy without visual control, goniotomy with a contact lens, and goniotomy while air is continuously injected will be presented. Their merits will be compared and the preoperative and postoperative care will be considered.

COURSE 210

Room 8 L — Period M-5 or T-5

TRUMAN L. BOYES, M.D.
New York, N. Y.

Problems in Eye Surgery

All ophthalmologists have surgical problems. Each member of the conference is invited to submit one of his problems in writing at the time of the conference, and an attempt will be made to answer these questions with definiteness and celerity. An opportunity will be afforded anyone who may wish to contribute his experience in solving these problems. This should insure a good cross section of opinions from men of experience.

COURSE 212

Room 815 Period M-4 or T-4

F. PHINIZY CALHOUN, JR., M.D.
Atlanta, Ga.

Dystrophies and Degenerations of the Cornea

The more common conditions under this heading will be grouped according to the underlying pathologic process and the site of origin in the cornea in the light of our present knowledge. This approach helps to avoid prevalent confusion in terminology and simplifies the clinical recognition of each condition by more closely correlating the clinical findings with the underlying pathologic process.

The course will be illustrated with lantern slides and will include a discussion of present day methods of therapy in these conditions.

COURSE 213

Room 8 L Period M-6 or T-6

J. V. CASSADY, M.D.
South Bend, Ind.

Dacryocystitis of Infancy

Tear sac infections occur in 5 per cent of new born infants. The lower end of the lacrimal duct is not patent in over one half of infants at birth. If it does not open spontaneously, excessive tearing and secondary infection occur. The patency of the duct is necessary for normal functioning lacrimal drainage. The method of probing the lacrimal duct is described, as well as the treatment that I advocate for this condition.

COURSE 214

Room 802 Period M-4 or T-4

WEBB P. CHAMBERLAIN, JR., M.D.
Cleveland, Ohio

Vertical Motor Anomalies

The surgical anatomy and physiology of the vertical muscles will be discussed and emphasis will be placed on the importance of careful analysis in the cardinal positions of gaze. The objective methods of testing will be stressed, including properly executed excursions, measurements with prisms and the head tilt test. Motion pictures will be used to demonstrate diagnostic procedures and to illustrate various anomalies of the vertically acting muscles.

COURSE 215

Room 808 Period T-5

MAX CHAMLIN, M.D.
New York, N. Y.

Perimetry: Technics for Detection of Minimal Defects

Technics for detection of minimal defects in visual fields caused by early lesions in visual pathways will be demonstrated. The choice of test objects and methods of recording defective field will be shown. The application of these principles to the tangent screen will also be mentioned. The interpretation of minimal findings will also be explained. Cases where the perimeter entirely supercedes the tangent screen, as well as the reverse, will be shown. The mounting of test objects on permanent carriers, as well as their care, will be demonstrated. Methods of recording various field defects will also be shown.

COURSE 216

Room 4 B Period M-4

PAUL A. CHANDLER, M.D.
Boston, Mass.

Cataract Surgery:
Complications During and After Operation

Secondary glaucoma in aphakia may be primary glaucoma but is usually secondary, due to pupillary block, epithelialization of the anterior chamber, or peripheral anterior synechias. Peripheral anterior synechias are brought about chiefly by the complications of delayed reformation of the anterior chamber, incarceration of iris or lens capsule in the wound, prolapse of iris and vitreous loss. Emphasis is placed on measures designed to prevent these complications which lead to glaucoma, and the treatment of the glaucoma is discussed from a medical and surgical standpoint.

COURSE 217

Room 8 W Period M-6 or T-6

TULLOS O. COSTON, M.D.
Oklahoma City, Okla.

Interesting Ophthalmoscopic Slides

The material covered will include slides on the various vascular diseases, diabetes, tumors, degenerative and inflammatory types of chorioretinitis.

COURSE 218

Room 816 Period M-6 or T-6

PAUL L. CUSICK, M.D.
Detroit, Mich.

Ptosis: Differential Diagnosis and Treatment

A brief review of etiology along with a classification of blepharoptosis will be given.

Various types and preferred surgical treatment will be illustrated with lantern slides. A motion picture will be shown which illustrates the difficulties encountered in Blaskovicz' operation. Means of avoiding these difficulties and simplifying the operation will be illustrated.

COURSE 219

Room 810 Period W-4 or Th-4

NORMAN L. CUTLER, M.D.
Wilmington, Del.

Selection and Variety of Procedures Used in Enucleation

There are now three general types of procedures used in enucleation: buried and not mobile, mobile buried, and semiburied or integrated.

The proper selection of the procedure to be used in enucleation depends on the experiences of the operator, the type of patient and his availability for postoperative follow-up. It is the surgeon's obligation to be familiar with the different types of implants, their advantages and disadvantages, and to give the patient the best cosmetic result possible.

COURSE 220

Room 8 J Period T-4

ALAN DAVIDSON, M.D.
New Bern, N. C.

Surgical Instruments: Preparation and Care

This discussion is designed for those ophthalmologists practicing in general hospitals who do not have nurses specially trained to care for ophthalmic surgical instruments. Mention will be made of the manufacture, materials, and choice of surgical instruments as well as their sterilization, preparation and care.

COURSE 221

Room 8 A or Room 8 M Period M-6 or Period W-6

A. GERARD DeVOE, M.D.
New York, N. Y.

Corneal Dystrophies

This course is designed for the practicing clinician. An attempt will be made to present an orderly and practical classification of the conditions now grouped under the term "corneal dystrophies and degeneration." Emphasis will be placed upon treatment.

COURSE 222

Room 8 M Period T-5 or Th-5

JOSEPH M. DIXON, M.D.
Birmingham, Ala.

Indirect Ophthalmoscopy in Office Routine and Intraocular Surgery

Many fundi and fundus lesions can be seen better by indirect ophthalmoscopy than by the direct method. Routine office technic and an outline for the development of skill will be described. An efficient office arrangement which gives the ophthalmologist a choice of direct or indirect ophthalmoscopy as indicated for each patient will be illustrated. Advantages and limitations of the two methods of ophthalmoscopy will be compared for the office, for the bedside, and for the operating room. A brief review of the early development of the indirect method will be presented with illustrations of various types of monocular and binocular equipment.

COURSE 223

Room 8 M Period W-4 or Th-4

EDWARD A. DUNLAP, M.D.
New York, N. Y.

Divergence Anomalies

These anomalies consist of divergence excess and divergence insufficiency. Both are characterized by certain specific findings that serve clearly to differentiate them from anomalies of convergence. Their location in the general classification of imbalances and statistics on their relative occurrence will be given.

Symptoms of each type will be listed, and the method of diagnosis will be discussed. Typical case measurements and pictures of each type will be shown.

Treatment, both conservative and surgical, will be outlined, and tabulated results of studies on over one hundred surgically treated cases of divergence excess will be presented.

COURSE 224

Room 8 D Period M-6

HAROLD F. FALLS, M.D.
Ann Arbor, Mich.

Practical Application of Heredity

The purpose of this course is to present the principles of heredity so that they may be employed by the clinical ophthalmologist in his daily practice. When possible, diseases having hereditary background will be illustrated and discussed. A demonstration of pedigree taking and interpretation will be presented.

COURSE 225

Room 4 A — Period T-5

HAROLD F. FALLS, M.D.
Ann Arbor, Mich.

Ocular Geriatrics

A comprehensive survey of the ocular changes and disease states associated with senescence. When possible, a differentiation will be made between universally occurring disease states in the aged eye and those disease processes appearing in senescence but having no direct relationship to the passage of time.

Treatment, care, and management of the senile eye and individual will receive consideration.

COURSE 226

Room 4 B — Period T-4

F. BRUCE FRALICK, M.D.
Ann Arbor, Mich.

Surgical Anatomy of Operations for Glaucoma

It is essential to any ophthalmic surgeon in performing the various surgical procedures on the globe to have an understanding of the anatomy of the eye. Familiarity with normal relationships gives confidence when corrective operations are undertaken in complicated cases. A knowledge of anatomy also includes an understanding of the variations from the normal and the effect these variations play in the functioning of the part. The surgical aspects of glaucoma therapy, therefore, require that the operator possess sufficient ocular anatomical insight to permit him to establish adequate drainage of aqueous to compensate for the known pathologic changes which have disturbed the normal physiology of aqueous exchange.

COURSE 227

Room 806 — Period W-6 or Th-6

BERNARD FREAD, M.D.
New York, N. Y.

Ideal Refraction Equipment: Survey of Instruments Used

Refraction is most important in the daily routine of every ophthalmologist. A good part of each working day is spent with details of refraction and not enough emphasis has been placed upon the tools necessary to make refraction easier, more accurate, and less time-consuming.

Every major refraction instrument manufactured in the United States and in the larger optical plants of England, France, Germany, Italy, Japan and Switzerland will be discussed. About two hundred lantern slides will graphically illustrate this equipment.

Attention will be given not only to elementary equipment used by the beginner but also to elaborate devices used for the objective and subjective measurement of refraction of particular interest to the experienced ophthalmologist.

The lecture will include the names and functions of various instruments and their manufacturers as well as the current cost.

COURSE 228

Room 4 B — Period W-4

WILFRED E. FRY, M.D.
Philadelphia, Pa.

Inflammatory and Degenerative Lesions at the Posterior Pole of the Eye: Differential Diagnosis

The differential diagnosis of inflammatory and degenerative lesions not only must be made between these two conditions but they must also be distinguished from malignancy. In malignant conditions the diagnosis is on a different basis than when the malignancy is in the midzone or in the anterior segment of the eye. When in the midzone or anterior segment, distinction must be made between a serous and a solid detachment. When the lesions are in the posterior segment the diagnosis must be made upon the ophthalmoscopic appearance plus all other information that can be afforded by a complete examination of the patient.

The situation is different when the macula alone is involved, and when the region of the disc is involved.

Types of lesions as they involve the macula and the perioptic region will be illustrated and the management discussed.

COURSE 229

Room 810 — Period M-5 or T-5

J. CONRAD GEMEROY, M.D.
Detroit, Mich.

External Diseases of the Eye

This lecture is illustrated with kodachrome slides in 3 D throughout. It consists of practically anything one can photograph of the lids, conjunctiva, cornea, sclera and anterior segment pathology of the eye. The slides are of such things as benign and malignant tumors, lacerations and various conjunctival and corneal infections, lacerations and traumatic injuries of the eyes and

anterior segment pathology of the iris and lens.

In as much as some of these pictures were taken before antibiotics came out, an attempt will be made to discuss each condition and try and bring the treatment up to date.

COURSE 230

Room 815 Period W-4 or Th-4

HAROLD GIFFORD, M.D.
Omaha, Neb.

Surgical Procedures on Lacrimal Apparatus

This course will present a review of the common surgical technic used in tear sac surgery. The surgical anatomy of the region will be covered. The technic of transplantation of the tear sac will be described in detail with lantern slides and motion pictures.

COURSE 231

Room 815 Period T-6 or W-6

JOHN F. GIPNER, M.D.
Rochester, N. Y.

Recent Advances in Ophthalmology

The hour will be spent in a review of advances in ophthalmic surgery. The chronological sequence and the refinements of the surgery in glaucoma and congenital cataracts will be given.

New procedures in cataract surgery and the relief of cataract surgery complications will be mentioned.

COURSE 232

Room 4 B Period W-5

ISADORE GIVNER, M.D.
New York, N. Y.

Associated Skin and Eye Manifestations of Systemic Disease

The appearance of lesions in both the skin and eye as manifestations of general disease makes it important to be familiar with the expressions in both systems for the better recognition and handling of systemic disorders. Among the diseases with representations in both systems, the following will be discussed:

I. Phakomatoses — Bourneville's disease, Recklinghausen's, Sturge-Weber.
II. Collagen diseases — acute disseminated lupus erythematosus, dermatomyositis, scleroderma and periarteritis nodosa.
III. Amino acid and vitamin deficiencies.
IV. Granulomatous diseases — brucellosis, sarcoidosis, coccidiomycosis.
V. Viral diseases — Kaposi's varicelliform dermatitis, measles, herpes zoster, vaccinia, variola, lymphogranuloma venereum.
VI. Miscellaneous — ocular mucous membrane syndrome of erythema multiforme, Vogt-Koyanagi, atopic dermatitis, pseudoxanthoma elasticum, xeroderma pigmentosum, blastomycosis, acrodermatitis enteropathica, malignant lymphoma and incontinentia pigmenti.

COURSE 233

Room 4 B Period M-5

EVERETT L. GOAR, M.D.
Houston, Texas

Management of Monocular Cataracts

For the purpose of this discussion a monocular cataract will be defined as an opaque crystalline lens in which the fellow lens is clear or only slightly opaque. Congenital monocular cataracts do not need operation as early as bilateral ones. The old dictum that a cataract should not be operated on until the vision in the other eye drops to 20/70 is no longer tenable. The Ridley acrylic lens was devised to meet this situation, but may ophthalmologists do not consider this a safe procedure. People in the active phase of life readily become accustomed to a contact lens and obtain binocular vision to a degree that makes them comfortable. Methods will be described and illustrations shown.

COURSE 234

Room 808 Period M-6 or T-6

LOREN GUY, M.D.
New York, N. Y.

Foreign Bodies

Means of preventing intraocular and intraorbital foreign bodies are reviewed. Aids in making a diagnosis and a localization are discussed. Surgical and medical therapy are outlined. Aftercare and follow-up procedures are given. There will be discussion of some instruments used for localizing and removing foreign bodies.

COURSE 235

Room 802 Period M-5 or T-5

ELIOTT B. HAGUE, M.D.
Buffalo, N. Y.

Beta Irradiation in Ophthalmology

In this course the practical aspects of applying radioactive material to the eyes will be discussed and demonstrated. Since

it is now well known that radium has notable therapeutic value in some eye disease for which there is a certain dearth of other effective treatment, a common-sense and sufficiently detailed approach to the safety factors involved will be attempted. Use of the technical language of radiology will be avoided except as accessory background.

COURSE 236

Room 8 D Period T-4 or W-4

GEORGE M. HAIK, M.D.
New Orleans, La.

Intraocular Foreign Bodies

Although the management of intraocular foreign bodies rests upon certain basic principles, the management of every case is an individual problem, especially with respect to therapy. An intraocular foreign body is always serious, the gravity of the wound depending upon its location. It does not, however, constitute a true emergency in the sense that immediate extraction of the object is necessary. Pinpoint localization is far more essential than speed of extraction. Extraction, in fact, is facilitated by delay for precise roentgenologic localization, supplemented by the use of the Berman or Carney locator. The technic of extraction must be related to the composition and location of the foreign body and the state of the eye. Removal by magnet is preferable, but nonmagnetic objects require surgical extraction, the procedure being carefully planned before any step of it is undertaken. The location of the object and its constitution may sometimes contraindicate extraction. Sympathetic ophthalmia is a remote and calculable, not an immediate, danger. Emergency enucleation is therefore seldom justified. Chemotherapeutic agents and antibiotics should be used routinely in all perforating wounds. Foreign protein therapy is also of great value. Since the results of treatment of intraocular foreign bodies are, at best, not outstanding, no precaution should be overlooked that can improve them. Many military practices, especially in respect to transportation of the injured and first aid, could profitably be transferred to civilian ophthalmology.

COURSE 237

Room 810 Period W-5 or Th-5

S. ALBERT HANSER, M.D.
St. Louis, Mo.

Studies in Ocular Allergy

This lecture will include methods used in testing for allergies, such as history, provocative tests, conjunctival tests, patch tests, skin tests, and injection tests. Special emphasis will be placed on conjunctival scrape smear with discussion of method for preparing and examining the slide.

A short discussion of the diagnostic anterior chamber puncture will be presented.

Likewise, discussion and treatment of the following conditions will be presented: chronic recurrent marginal blepharitis, phlyctenular keratoconjunctivitis, vernal conjunctivitis, and nongranulatomous uveitis. In conclusion, recent studies in the use of cortisone and hydrocortisone and their relationship to ophthalmology will be presented.

COURSE 238

Room 8 M Period T-6

ROBISON D. HARLEY, M.D.
Atlantic City, N. J.

Lesions of the Third, Fourth and Sixth Cranial Nerves: Topical Diagnosis

Topical diagnosis of lesions of the third, fourth and sixth cranial nerves requires a systematic consideration of the orbit, cavernous sinus, base of the brain, brain stem, nucleus and supranuclear connections. The course is designed especially for the practicing ophthalmologist in the differential diagnosis of various motor anomalies of the eye and the associated signs. A minimum of anatomy will be reviewed to describe various syndromes as they occur in this clinical approach to the subject. Short case histories will be utilized for illustration of important signs and symptoms.

COURSE 239

Room 8 P Period M-6 or T-6

DAVID O. HARRINGTON, M.D.
San Francisco, Calif.

Dynamics of Phacoerisis

A demonstration of the dynamics of intracapsular lens extraction by the suction method illustrated with slides and slow motion pictures, showing the manner in which the suction cup of the erisophake acts upon the lens capsule and zonular lamella. Special attention is directed to (1) capsular traction, (2) capsular distortion at the equator, (3) transmission of capsular stress to the zonule, (4) zonular stripping, (5) variations in technic of extraction based upon type of cataract and knowledge of the dynamics involved, (6) degree of vacuum and technic of manipulation of lens in both sliding and tumbling procedures, (7) compli-

cations encountered in phacoerisis, and (8) special applications and uses for the suction method. It is believed that a careful study and analysis of the mechanics involved in the suction method of grasping, dislocating, tumbling and delivering the lens within its capsule will enable the average surgeon to anticipate and thereby minimize complications.

COURSE 240

Room 8 D Period T-5 or W-5

HAROLD L. HARRIS, M.D.
Evanston, Ill.
BY INVITATION

Anesthetic Agents and Technics for Ophthalmologic Surgery

The material to be discussed will cover the various anesthetic agents and methods useful in general anesthesia for ophthalmologic surgery together with the indications and cautions. Positive measures will be presented to avoid respiratory difficulties such as cough, laryngospasm, and other obstructions, Detailed procedures will be described for anesthetizing infants, small children, and adults for all of the various surgical procedures in ophthalmology. These procedures will describe premedication, induction agents and methods, endotracheal intubations. Detailed procedures will be described management of the recovery period.

There will be discussion of the proper uses of pentothal sodium and a critical evaluation of its abuses.

COURSE 241

Room 819 Period M-6 or T-6

WILLIAM F. HUGHES, JR., M.D.
Chicago, Ill.

Use of Strontium Applicator in Ophthalmology

Because beta radiation is now commercially available for ophthalmic use, the rationale, indications and contraindications, dosages and complications become more important. The early and late results of beta radiation therapy will be evaluated.

COURSE 242

Room 8 D Period T-6

FRITZ JARDON
Detroit, Mich.
BY INVITATION

Fitting of Ocular Prostheses

The entire field of prosthesis-fitting, following various surgical procedures, will be discussed. Subjects of interest include enucleation, eviseration, Tenon's capsule implants, integrated implants, secondary implantation and socket restoration.

Restoration of abnormalities in sockets by using pressure conformers, their use in enlarging sockets and lids in children born without an eye. The preparation for good functioning prostheses, and methods which give best cosmetic end results.

Taking molds of sockets for cover lenses and eyes will be explained, as movement is often greatly improved by an eye made over a mold.

Color slides will be shown.

COURSE 243

Room 8 K Period T-6

HAROLD H. JOY, M.D.
Syracuse, N. Y.

Role of Angiography in Ophthalmology

The presence of an unexplained visual defect should always suggest the possibility of an intracranial lesion. Since not only vision but life itself may be at stake, early diagnosis is essential. In such cases angiography will frequently demonstrate the location and the character of the lesion before any other measure.

The object of this course is to familiarize ophthalmologists with this important diagnostic procedure. After a review of the normal anatomy of the arteries and visual pathways at the base of the brain the principles of angiography as related to ophthalmology will be discussed. This will be followed by the projection of angiograms accompanied by case reports demonstrating the diagnosis of intracranial lesions affecting the chiasm and optic nerves.

COURSE 244

Room 8 W Period M-5 or W-5

ROSCOE J. KENNEDY, M.D.
Cleveland, Ohio

Eye Changes in Diabetes: Diagnosis and Treatment

Diabetes is an endocrine disturbance which not only produces retinal changes but may also affect the optic nerve, lens, iris, extraocular muscles and refractive errors. The typical ophthalmological findings will be presented and discussed, especially in relationship to the severity of the disease.

Problems in differential diagnosis, including eye findings and laboratory tests will be discussed.

The importance of ophthalmological findings in the care of the diabetic patient and present concepts of treatment, as well as case records, will be presented.

COURSE 245

Room 808 Period W-4 or Th-4

ALFRED KESTENBAUM, M.D.
New York, N. Y.

Reading Glasses For Patients With Poor Vision

Three reading devices are in use: the magnifying lens, the telescopic loupe and a very strong plus-glass as reading glass. The magnification of a magnifying lens equals one quarter of its strength in diopters. The magnification of a telescopic system equals the quotient of the strength of the ocular lens divided by that of the objective. A "strong" reading glass causes magnification by allowing a closer approach of the letters to the eye.

In poor vision, the degree of amblyopia may be expressed in RV, reciprocal of vision, f.i., in 20/200, RV is 10. Calculations have resulted in a simple formula, which allows to find immediately the required reading glass for each degree of amblyopia and for each size of given letters. F.i., patients with 20/100, 20/200, Fg 10 ft., Fg 5 ft., are able to read Jaeger 5 with plus 5, plus 10, plus 20, plus 50 D, respectively.

The few exceptions, in which the rule cannot be used, such as a relative partial central scotoma, are discussed.

Because of the severe spheric aberrations, the diameter of the strong glass has to be small (f.i., 15 mm. for plus 30 D): such glasses may be called mikroglasses. The spheric aberration may also be diminished by other optical procedures.

By use of the above-mentioned formula, patients with poor vision, down to finger-counting, can still be enabled to read normal print.

Since an eye glass is only a special form of a magnifying lens, the above formula can be used for the latter, too. The calculated "required diopters" have simply to be divided by four to give the required "magnification."

Whether the patient should use such a "mikroglass" or a "magnifying lens" or a telescopic loupe, depends on the needs of the individual occupation, since each of the three devices has advantages and disadvantages, which are enumerated.

COURSE 246

Room 8 C Period M-6 or T-6

JOHN E. L. KEYES, M.D.
Cleveland, Ohio

Intraocular Vascular Disease

COURSE 247

Room 8 H Period M-6 or T-6

THOMAS J. KIRBY, JR., M.D.
Rochester, Minn.

Problems in Presbyopia

This course is intended primarily to discuss special problems that arise in prescribing for the presbyopic patient. Management of the prepresbyopic patient who has unusual demands made upon his eyes will be covered. Special occupational needs for presbyopic patients will be dealt with in detail, including the application of occupational multifocal lenses. The prescription of lenses for patients with very unusual working distances also will be discussed.

COURSE 248

Room 8 W Period M-4
or or
Room 8 K Period Th-4

BERTHA A. KLIEN, M.D.
Chicago, Ill.

Clinical Pathology of Retinal Lesions

The clinical manifestations of a diseased retina and pigment epithelium and their pathogenesis in general will be discussed prior to a demonstration of the specific findings in a selected group of diseases of the retina, including diabetes, macular lesions of vascular origin and their differential diagnosis, and several other retinal diseases due to vascular pathologic processes.

COURSE 249

Room 8 J Period T-5

ABRAHAM L. KORNZWEIG, M.D.
New York, N. Y.

Practical Embryology

A study of the embryology of the eye has many practical values to the ophthalmologist. It enables him to understand the structure of the eyeball by seeing how it developed. This also helps him better to appreciate the functioning of the different parts of the globe. Above all, it makes it simpler to know which defects in the eye are due to developmental and hereditary causes, and which are due to environmental conditions.

A series of slides will be shown demonstrating critical periods in the development of the human eye. Special attention will be given to abnormalities of the position of the eye; congenital cataracts; congenital hydrophthalmos; typical colobomata of the iris, choroid, ciliary body and optic nerve; aniridia; microphthalmia; abnormalities of the optic disc; congenital defects in the retina; and retrolental fibroplasia.

COURSE 250

Room 4 A — Period T-4

PETER C. KRONFELD, M.D.
Chicago, Ill.

Glaucoma Surgery: End Results

A follow-up of glaucoma patients for a minimum period of eight years after surgery reveals four main facts: (1) gross differences in the response of the two principal types, the acute narrow angle and the chronic open angle glaucoma; (2) a strong correlation between normalization of ocular tension and stationary course of the disease in the large majority of the cases of glaucoma; (3) gross differences in the end result (in the chronic open angle type) depending upon the stage of the disease present when the normalization of tension became effective, and (4) a greater incidence of cataract than in unoperated glaucomatous or in undiseased eyes of the same age group.

COURSE 251

Room 8 L — Period M-4 or T-4

BRENDAN D. LEAHEY, M.D.
Lowell, Mass.

Corneal Transplant

Stress will be laid on practical points of preparatory surgery and therapy, operative technic, and complications with special emphasis on current trends in graft fixation. Various types of overlying, direct sutures, and splints will be shown along with several new instruments. A new version of the author's preplaced track suture method is included. The discussion will be continuously illustrated with slides and a short motion picture.

COURSE 252

Room 810 — Period M-4 or T-4

PLACIDUS J. LEINFELDER, M.D.
Iowa City, Iowa

Papilledema and Optic Neuritis: Differential Diagnosis

Edema of the nerve head occurs in a number of general and local diseases, and in most instances the clinical examination of the disc does not allow one to make a differential diagnosis. This is true because edema in all cases is due to active or passive congestion of the capillaries of the nerve head. The relationship of venous pressure, increased intracranial pressure, hyperemia, and inflammation to the occurrence of swelling will be discussed in relation to the many causes for papilledema.

COURSE 253

Room 8 S — Period M-4 or T-4

ALBERT N. LEMOINE, JR., M.D.
Kansas City, Mo.

Vitreous Opacities

The anatomy and embryology of the vitreous will be briefly reviewed. The physical and chemical properties found in the normal and pathologic vitreous will be summarized.

Specific types of vitreous opacities to be considered are: congenital remnants of the embryonic vascular system; protein coagula; synchysis scintillans; asteroid hyalitis; inflammatory exudates; blood; and retinitis proliferans.

Therapeutic measures will be discussed.

COURSE 254

Room 1 A — Period T-6

IRVING H. LEOPOLD, M.D.
Philadelphia, Pa.

Advances in Therapy

Each year new agents with therapeutic potentiality are introduced into Ophthalmology. These include antibiotics, anesthetics, autonomic drugs, enzymes and hormones. Increased knowledge of ocular disease allows one to better utilize older drugs. The limitations, ability, and optimal methods of administration of the new agents will be considered.

COURSE 255

Room 8 M — Period W-5

CECIL W. LEPARD, M.D.
Detroit, Mich.

Eye Diseases Common to Children

Those ocular diseases occurring primarily in children constitute a group of special interest to the ophthalmologist, particularly when the method of examination or the differential diagnosis differs from that for those diseases in the adult. The technic and results of examination of premature infants will be discussed. The following syndromes, together with lantern slide demonstration of

findings in the eye and orbit and pathologic photomicrographs, will be demonstrated: neuroblastoma, chloroma, Schuller-Christian's disease, and eosinophilic granuloma.

COURSE 256

Room 803 Period Th-4

IRVIN LEVY, M.D.
Trenton, N. J.

Motion Picture Photography in Ophthalmology: Methods and Highlights

In this course we will start with a brief discussion of general motion picture photographic technic. From this point there will be a more detailed discussion of ophthalmologic photography, including examples of recommended types of equipment such as cameras, lenses, lighting and other important accessories. Specific details of photographic technic will be given, with an attempt to simplify and standardize ocular photography. Good and bad examples with reasons for such, will be shown. The technic of sound as an accessory to photography will be briefly demonstrated.

COURSE 257

Room 8 K Period M-6
or or
Room 8 V Period T-5

PHILIP M. LEWIS, M.D.
Memphis, Tenn.

External Diseases

This course will consist of a kodachrome clinic based on about 200 slides showing some unusual diseases and many common diseases of the lids, conjunctiva and cornea. Several new slides have been added to the group shown last year. The differential diagnosis and the methods of treatment, both medical and surgical, will be discussed.

COURSE 258

Room 8 S Period M-5 or T-5

ARTHUR LINKSZ, M.D.
New York, N. Y.

Telescopic Lenses and Magnifying Systems

"Telescopic spectacles" are small Galilean telescope systems of especial design, made for people with poor central vision. Their usefulness is limited.

"Microsopic spectacles" are essentially strong plus lenses, or strong plus additions to the patient's distance correction. They are extremely useful and should be prescribed much more often than they have been in the past. Their design, indications and some simple rules of thumb, useful to the prescribing clinician, will be described and illustrated on some actual case histories.

COURSE 259

Room 8 C Period W-4

COL. AUSTIN LOWREY, JR., (MC)
Honolulu, Hawaii

Tropical Ophthalmology

The eye complications of the more common as well as some of the more rare tropical diseases will be presented. The lecture will include among others the following diseases: Leprosy, malaria, filariasis (oncocercosis), lymphogranuloma venereum, trypanosomiasis, histoplasmosis, amebiasis, various helminthic diseases including infestation with nematodes and cestodes, myasis, nutritional diseases, and medically important insects, animals and plants. The lecture will be illustrated with slides.

COURSE 260

Room 8 S Period M-6 or T-6

JOHN P. MACNIE, M.D.
New York, N. Y.

Head Trauma with Ocular Significance

Ocular symptoms and signs associated with trauma to the head will be considered. The mechanisms whereby head injuries may lead to ocular changes will be outlined, and the effect upon the eye of involvement of the various cranial nerves and portions of the brain will be analyzed. The ocular effects of intracranial hemorrhage, injuries in the region of the cavernous sinus, and the ocular evidence of skull fracture will be considered.

COURSE 261

Room 8 D Period W-6 or Th-6

AUREL E. MANGOLD
New York, N. Y.
BY INVITATION

Proper Fitting of Glasses

This discussion will stress the following subjects:

1. The necessity of analyzing the prescription so that the finished glasses will give the maximum of comfort and efficiency
2. Anisometropic and unusual prescriptions and the effects on visual comfort
3. The importance of individual pupillary distance measurements
4. Lens form and its effect on visual comfort

5. The importance of vertex distance
6. The proper selection of bifocals in cases of hyperopia and myopia
7. Colored lenses
8. All types of telescopic and microscopic systems
9. Methods of determining causes of patients' complaints with finished glasses
10. Suggested procedure for examination of a pair of glasses

COURSE 262

Room 8 W — Period W-4 or Th-4

MORTIMER MANN, M.D.
Indianapolis, Ind.

Hypertensive Vascular Changes in the Fundus

To properly interpret the changes produced in the fundus as a result of arterial hypertension, they must be correlated with other clinical and laboratory data. The various ophthalmoscopic findings in essential hypertension, malignant hypertension, toxemia of pregnancy, acute and chronic nephritis will be presented and discussed in relationship to the other manifestations of these diseases. The extent to which observations of the fundi are helpful in prognosis and treatment will also be considered.

COURSE 263

Room 8 F — Period M-6 or T-6

WILLIAM A. MANN, M.D.
Chicago, Ill.

Optical Correction of Aphakia

This course will deal with the following topics of discussion: problems of refraction of the patient with early cataract; correction of aphakia; methods of objective and subjective testing; precautions in ordering lenses; methods of securing single binocular sults with finished glasses; types of cataract lenses; methods of securing single binocular vision in bilateral and monocular aphakia, and contact lenses.

COURSE 264

Room 8 C — Period W-5 or Th-4

MURRAY F. McCASLIN, M.D.
Pittsburgh, Pa.

Ocular Anesthesia

This lecture will deal first with the evaluation of the operative risk by simple tests that fall within the realm of the ophthalmic surgeon. The Benedict-DuBois curve will be reviewed. This forms the basis for proper premedication. The choice of the local anesthetic agent, along with adjuvants such as dramamine, hyaluronidase and curare, will be discussed at length.

The final part of the lecture will cover technics for various procedures, such as chalazion, entropion, ectropion, lid plastic, ocular injuries, cataract and detachment operations. These will be illustrated.

COURSE 265

Room 810 — Period W-6 or Th-6

JAMES L. McGRAW, M.D.
Syracuse, N. Y.

Contact Lenses

The relative merits of contact lenses as compared with spectacles will be presented. The results of a comparative analysis of some of the various types of lenses will be presented. Comparative fitting time, wearing time, and subjective and objective effects will be discussed. Indications and contraindications for contact lenses will be presented.

COURSE 266

Room 802 — Period W-5 or Th-5

WILLIAM P. McGUIRE, M.D.
Winchester, Va.

Heterophoria and Heterotropia: Surgical Treatment

The course will deal with the most commonly accepted methods of surgically correcting the various muscle imbalances. Proper diagnosis will be stressed. Particular attention will be given to the correction of the vertical motor anomalies. Lantern slides and a short motion picture will illustrate many of the procedures.

COURSE 267

Room 808 — Period W-6 or Th-6

GEORGE R. MERRIAM, JR., M.D.
New York, N. Y.

Radiotherapy

The lecture will cover all types of irradiation employed in the treatment of ophthalmic diseases and neoplasms. Superficial therapy, beta irradiation and Grenz ray therapy will be discussed, particularly as regards the late effects and indications for use. The factors employed in the treatment of such conditions, as epithelialization of the anterior chamber, basal and squamous cell carcinoma of the lids, retinoblastoma, lymphosarcoma and metastatic carcinoma will be discussed. The exact methods of treatment, complications and results will be mentioned. The indications for the treatment of

hemangiomas of the lid, conjunctiva and orbit, the methods employed and results will be discussed.

COURSE 268

Room 802 Period W-4 or Th-4

W. HOWARD MORRISON, M.D.
Omaha, Neb.

Office Management of Glaucoma

The control of glaucoma as an office procedure will be considered. Attention will be directed to the action and proper prescribing of medications. Particular stress is to be placed upon the use of miotics at a time which shortly precedes the diurnal peak or peaks in intraocular pressure.

The role and frequency of tonometry, gonioscopy, ophthalmoscopy, biomicroscopy, refraction and perimetric study will be discussed. A consideration of office records, environmental difficulties and patient education will be undertaken.

COURSE 269

Room 4 A Period W-5

CARROLL R. MULLEN, M.D.
Philadelphia, Pa.

Ophthalmic Emergencies

Treatment of acid and alkali burns of eye and adnexa, consideration of causes and treatment for sudden loss of vision with special attention to use of anticoagulant medication will be discussed. Value of roentgen studies in ocular injuries with consideration of emergency surgical approach and prognosis and handling of anterior chamber hemorrhages, iris prolapse and iridodialysis will be studied. Emergency care of lid injuries and trauma to extraocular muscles will also be emphasized.

COURSE 270

Room 8 W Period W-6 or Th-6

JOHN MURPHY
Boston, Mass.
BY INVITATION

The Preparation of Ophthalmic Medications

COURSE 271

Room 807 Period W-4 or Th-4

JAMES A. OLSON, M.D.
Detroit, Mich.

Iritis, Iridocyclitis, Keratitis: Differential Diagnosis and Treatment

This course will present a review of the differential diagnostic points in nongranulomatous and granulomatous inflammations of the anterior uveal tract and the nonsuppurative inflammatory lesions of the cornea. Attention will be directed to the current methods of therapy, including the use of corticotropin (ACTH), cortisone, and hydrocortisone. The efficacy of the various methods of administering these agents, the dosages, and the problem of prolonged treatment and repeated treatment will be discussed. The use of antibiotics in selected cases and the other supportive therapeutic measures will be presented. Attention will be directed to the continued importance of careful physical examinations and the subsequent correction of possible causative focal defects or generalized disease processes.

COURSE 272

Room 8 L Period W-6

HUBERT O. PAULSON, M.D.
Lincoln, Neb.

Lighting for Comfortable and Accurate Seeing

Illumination plays as important a part in asthenopia under present day occupations as do refractions and muscular coordinations. Many industrial and home visual tasks can be accomplished much more efficiently and comfortably under proper illumination conditions. The five requirements of illumination will be presented according to more recent standards. The proper use of flourescent and incandescent sources of light will be discussed.

COURSE 273

Room 802 Period W-6 or Th-6

FRANK PAYNE, M.D.
New York, N. Y.

Unilateral Visual Failure Due to Intracranial Lesions

This discussion concerns patients having unilateral failure of vision as the early or outstanding symptom, without ocular, medical or neurological clinical signs which would make the diagnosis obvious. The differential diagnosis considers lesions affecting predominantly one optic nerve.

Special emphasis is given to compression lesions since they are too frequently misdiagnosed as retrobulbar neuritis and consequently allowed to progress to unilateral blindness and involvement of the other optic nerve. These compression lesions threaten not only the sight but the life of the individual.

The features of the visual field defects observed in these lesions and practical points in the technic of the clinical elicita-

tion of these field defects are described. Illustrative cases are shown. Treatment is mentioned briefly.

COURSE 274

Room 8 S Period W-6 or Th-6

CHARLES A. PERERA, M.D.
New York, N. Y.

Retinal Detachment

Successful surgery in serous detachment of the retina depends upon a knowledge of the etiologic factors, the preoperative study of the patient, and the technic of operation. In addition to a discussion of these subjects, this course will also deal with the prognosis as affected by preoperative and operative findings.

COURSE 275

Room 815 Period T-5 or W-5

RAYMOND L. PFEIFFER, M.D.
New York, N. Y.

Roentgenographic Diagnosis of Congenital Lesions of the Eye and Orbit

The sphere of usefulness of the x-ray in ophthalmology has been so greatly extended in recent years that it is now imperative that the ophthalmologist be familiar with its uses and limitations. In 50 per cent of cases of exophthalmos roentgenographic changes are present and are most frequently diagnostic. Tumors of the lacrimal gland, tumors of the optic nerve, dermoids and epidermoids, meningiomas, hemangiomas, and tumors of adjacent structures will be especially considered. A vast amount of classified diagnostic material prompting brief discussions of a diversity of subjects will be presented.

COURSE 276

Room 4 B Period W-6

ADOLPH POSNER, M.D.
New York, N. Y.

Glaucomatocyclitic Crises

The syndrome of glaucomatocyclitic crises consists of recurrent unilateral attacks of acute noncongestive glaucoma associated with a mild form of cyclitis. It constitutes a definite entity which must be differentiated from other types of glaucoma.

This condition is more common than is generally suspected. It may easily be mistaken for acute narrow angle glaucoma, since the elevated tension dominates the picture and any evidence of cyclitis is often masked by corneal edema. Failure to recognize this condition may lead to overtreatment and sometimes to unnecessary surgery.

The course will deal with the clinical manifestations, differential diagnosis, and therapeutic management of the syndrome.

COURSE 277

Room 810 Period M-6 or T-6

M. HAYWARD POST, M.D.
St. Louis, Mo.

Infection in Ophthalmology: Preventive Measures

Infection is still omnipresent, despite antibiotics and chemotherapeutics. There are numerous sources of contamination. The one most frequently overlooked is that due to dust-borne organisms.

Before considering the possibilities of sterilization in surgery, it should be borne in mind that sterility is a relative term. Some factors influencing sterilization are technics, the temperature at which experiments or operations are carried out, the presence of detergents inactivating the various sterilizing solutions, and the resistance of the organisms.

A discussion of infection occurring in office practice, and methods of its prevention, will follow. The various methods of sterilization will be discussed, such as cathodic protection in boiling water, heating in oil, exposure to gases, and the effect of chemical solutions. The necessity that any method be noninjurious to instruments and potent in its action will be emphasized.

Having laid down these general premises, the effect of the author's solution on instruments and sutures, and various criticisms of it, will be considered in more detail. Afterwards will follow a discussion of dust-borne infection, and the effect upon such infection of dipping the instruments in boiling water, in zephiran chloride, or exposing them to radiation by ultraviolet rays of 2537 angstrom units. Numerous experiments illustrating the effects of such methods will be elaborated in detail.

The final section of the discussion, which will be stressed particularly, will be the effect of ultraviolet radiation upon exposed solutions and solutions contained in polyethylene vials. The consideration will deal not only with the germicidal effects of such exposure but also the effect upon the pharmacological activity of the various drugs in the armamentarium of the ophthalmologist.

COURSE 278

Room 8 T — Period T-4

M. ELLIOTT RANDOLPH, M.D.
Baltimore, Md.

Handling Patients with Advanced Glaucoma

This course will consist of a review of the rationale of various types of medical and/or surgical treatment of cases with advanced glaucoma, with analysis of particular types of advancing field defects and the appropriate medical or surgical treatment.

Advancing glaucoma in the presence of cataract, cataract following glaucoma surgery, glaucoma in the presence of retinal pathology, and the control of pain in absolute glaucoma will be discussed.

COURSE 279

Room 812 — Period W-4 or Th-4

WALTER Z. RUNDLES, SR., M.D.
Flint, Mich.

Streak Retinoscopy

The use of the streak retinoscope is compared with that of the ordinary plane mirror retinoscope, and a procedure suitable for routine streak retinoscopy is outlined. Among the advantages of the method are the clarity of the fundus reflex, the ability to measure accurately the refraction in different meridians of the eye individually, the accuracy with which the axis of astigmatism can be determined and the ability to perform retinoscopic examination routinely with contracted pupils, and the accurate determination of refraction in the aphakic eye.

COURSE 280

Room 4 A — Period M-5

RALPH O. RYCHENER, M.D.
Memphis, Tenn.

The Lacrimal Apparatus

This course will present a general review of the lacrimal apparatus, with special emphasis on the treatment of some of the minor but rather troublesome phases encountered in private practice, as well as the more dramatic and quite satisfactory methods of tear sac surgery. The office management of congenital stenosis and the more popular technics of dacryocystorhinostomy will be fully illustrated with slides.

COURSE 281

Room 4 B — Period M-6

HAROLD G. SCHEIE, M.D.
Philadelphia, Pa.

Emergency Eye Surgery

This course will present the management of those conditions which result from trauma to the eye and adnexa. The management will be divided into emergency and definitive care. Emergency treatment should be mainly prophylactic and aimed at preventing further injury than that caused by the initial trauma, and to prevent as far as possible future complications. The second phase, which usually falls within the realm of the ophthalmic surgeon, will be discussed in greater detail.

COURSE 282

Room 8 A — Period T-6
or — or
Room 814 — Period W-5

HAROLD G. SCHEIE, M.D.
Philadelphia, Pa.

Surgery in Congenital Glaucoma

The surgical treatment of juvenile and infantile glaucoma will be discussed. The development of goniopuncture and the results obtained in the treatment of juvenile glaucoma will be presented. The author's method of goniotomy for infantile glaucoma will be illustrated by slides and a motion picture. An analysis of the results obtained from goniotomy, goniopuncture, or a combination of the two will be made.

COURSE 283

Room 8 D — Period M-5

G. VICTOR SIMPSON, M.D.
Washington, D. C.

Convergence Insufficiency and Divergence Excess: Office Management

This course will consider the management of convergence insufficiency and divergence excess after the diagnosis has been made. The criteria upon which the diagnosis of this type of muscle imbalance is based will be discussed.

The items in the management to be stressed will be the proper use of the following measures:

1. Strengthening of convergence movements by pin exercises and loose prism exercises
2. Strengthening of fusion by orthoptics
3. Overcoming suppression as an important point in the management of divergence excess
4. Correction of errors of refraction
5. Use of prisms incorporated in the glasses
6. Elimination of contributing causes such as poor general health, overwork, and emotional factors

7. Elimination of inattention or daydreaming, which allows fusion to be broken up and an abnormal position of rest to be assumed

The results of office treatment as measured by the relief of symptoms or change in the position of the eyes will be presented.

COURSE 284

Room 816 Period W-6 or Th-6

JAMES W. SMITH, M.D.
New York, N. Y.

Practical Points in Office Procedure

The following subjects, selected from personal experience as a teacher and clinician, will be discussed:

1. Diagnostic approach in eliciting case histories
2. Consultation room psychology and philosophy
3. Helpful technics in examinations and refractions
4. Recognition and avoidance of diagnostic and therapeutic pitfalls
5. Valuable new drugs recommended for office use.

COURSE 285

Room 819 Period W-4 or Th-4

EDMUND B. SPAETH, M.D.
Philadelphia, Pa.

Concomitant Strabismus: Handling the Vertical Component

There is but little question that disturbances in the vertically acting muscles are a significant etiologic factor in lateral concomitant strabismus. Also, it is equally certain that disturbances in the action of these vertically acting muscles result from a primary lateral strabismus. The relationship of these two possibilities controls to quite an extent the therapy of these situations. These factors as related will be discussed in detail.

COURSE 286

Room 4 B Period T-6

EDMUND B. SPAETH, M.D.
Philadelphia, Pa.

Plastic Surgery: Practical Aspects

This course is planned largely to cover those plastic defects which result from the surgery necessary for the surgical cure of malignancies of the eyelids and the orbit. This will thus differ somewhat from earlier courses in that it will be a bit more detailed with a more definite purpose. The technics to be considered will be those which have to do with the repair of the lid margins, of the substance of the lids, and the reconstruction of the orbit through sliding flaps, pedicle flaps, lid substitutions, and skin and mucous membrane free grafts.

COURSE 287

Room 8 S Period W-4 or Th-4

ELLIS H. STEFFENSEN, M.D.
Detroit, Mich.

Use of ACTH, Cortisone and Hydrocortisone in Ophthalmology: Contraindications, Complications and Clinical Value

Indications for the use of ACTH, cortisone and hydrocortisone in the treatment of ocular diseases will be discussed.

Currently accepted therapeutic programs for the treatment of acute and chronic lesions will be outlined, together with the precautionary measures necessary for the protection of the patient from possible adverse pharmacologic side effects. The physiologic basis for the use of these drugs in the treatment of various ocular lesions will be briefly reviewed.

COURSE 288

Room 8 C Period W-6 or Th-6

RUSSELL L. STIMSON
Los Angeles, Calif.
BY INVITATION

Lenses for the Aphakic

A simplified procedure by which cataract lens prescriptions are interpreted into best lens forms will be described. The salient optical problems of the aphakic eye and its correcting lens will be briefly reviewed. The fitting method will be evaluated by comparison of the summarized results of numerous ophthalmologists covering a three year period.

COURSE 289

Room 4 A Period M-6

KENNETH C. SWAN, M.D.
Portland, Ore.

Developments in Ophthalmic Therapeutics

During the past year a number of promising therapeutic agents have been introduced. These include new anesthetics, analgesics, antibiotics, autonomic drugs, hormones, enzymes, and anti-enzymes. New concepts of drug action are evolving and some principles of applying older drugs are being revised. These will be reviewed, with a contemporary evaluation of new drugs.

COURSE 290

Room 8 H Period W-6 or Th-6

COMDR. GEORGE LEROY TABOR, JR. (MC) USN
San Francisco, Calif.

Vertical Muscles

The discussion will be confined principally to the clinical methods of diagnosing the vertical muscle palsies. Emphasis will be placed on the differential diagnosis of pareses of the oblique muscles, particularly the superior oblique. The anatomy and physiology of the vertical muscles will be discussed briefly as they apply to the clinical investigation. The Helmholtz test, considered to be of great diagnostic benefit, will be described in detail. The operation for tucking the superior oblique muscle, using the temporal approach without removal of the superior rectus, will be briefly discussed. This is considered to be the operation of choice for strengthening the action of a paretic superior oblique.

COURSE 291

Room 8 F Period W-6 or Th-6

I. S. TASSMAN, M.D.
Philadelphia, Pa.

Retinopathy in Diabetics

The ophthalmoscopic evidences and differential diagnosis are described. The importance of continued observation and study of the fundus picture throughout the duration of the disease are emphasized.

The present knowledge based on the more recent investigations concerning the nature and occurrence of the retinal lesions will be presented.

The relationship of dysfunction of the autonomic nervous system, the Kimmelstiel-Wilson syndrome and other disorders associated with diabetic retinopathy will be discussed.

The management of the diabetic and the effect of present day therapy on the development of retinopathy in all stages of the disease, will be fully considered.

COURSE 292

Room 8 S Period W-5 or Th-5

FREDERICK H. THEODORE, M.D.
New York, N. Y.

Ocular Therapeutics

An appreciation of the potentialities, as well as the limitations, of the agents at our disposal is a prerequisite for effective therapy. Many new and potent drugs are now widely used in ocular therapeutics. Valuable as they are, in addition to the dangers from injudicious use, their introduction has posed other therapeutic problems.

The course offers a practical clinical approach to the treatment of external diseases of the eye, with a critical evaluation of those drugs, both old and new, currently used for this purpose. The actions of the drugs themselves, their indications and specific contraindications, the capricious behavior and unreliability of some of them, as well as methods of application, are considered in detail. The importance of vehicles in general, the choice of appropriate ones and specific problems and dangers inherent in the prescribing of ophthalmic drugs, are stressed. The necessity for differentiating drug reactions due to allergy from drug reactions due to irritations will be discussed from the therapeutic point of view. General principles concerning the treatment of ocular eczemas are outlined. The entire lecture is illustrated by kodachromes of clinical cases.

COURSE 293

Room 8 K Period W-6 or Th-6

ARNO E. TOWN, M.D.
Philadelphia, Pa.

Adjuncts in Wound Closure

One of the problems of cataract surgery is the healing of the section. The perfect form of wound repair must be a technic which enables the wound to heal quickly and firmly. The complications incident to a leaky wound may be disastrous. Some of these, such as downgrowth of epithelium, prolapse of the iris and cysts in the anterior chamber, will be classified. Suggestions will be made for their prevention.

COURSE 294

Room 8 A Period W-5 or Th-5

C. DWIGHT TOWNES, M.D.
Louisville, Ky.

Complications of Cataract Surgery

This lecture, the material for which is drawn entirely from personal experience, will be divided into two parts.

The first, dealing with complications arising during cataract surgery, methods by which these complications may be prevented or the frequency of their occurrence minimized will be discussed in detail.

The second portion of the lecture will deal with postoperative complications with particular emphasis being laid upon late loss of the anterior chamber with or without chor-

oidal separation, and upon complications arising from rupture of the hyaloid membrane.

COURSE 295

Room 814 Period M-6 or T-6

CLARENCE A. VEASEY, JR., M.D.
Spokane, Wash.

Refraction Difficulties

This course assumes that glasses have been prescribed, found correct, and the patient is still unhappy. Sources of discomfort considered include adjustment requirements for distance and near, necessary decentration of plus lenses, necessity of tilting, which requires a change in the optical center. Tilting induces an increase in sphere and cylinder. This can be calculated and allowed for.

Vertex distance is the distance between the cornea and posterior surface of the corrective lens. When vertex distance in the finished glasses differs from that of the trial frames, a change in strength of both sphere and cylinder is necessary and is calculated by a simple method. Anisometropia induces false hyperphoria resulting from the prismatic effect of compound lenses. Method of calculating the amount of prism in any sphere-cylinder combination at any axis and the resultant hyperphoria is explained. Methods of overcoming induced hyperphoria include change in adjustment, compensated segments, bicentric grinding and prisms.

Also considered are the relationship of convergence and accommodation, special problems of aphakia and multifocal lenses. All calculations will involve arithmetic only and inspection of tables. The course will be illustrated by lantern slides. The tables essential to applying the principles elucidated in this course can be obtained in the author's instruction monograph, "Refraction Difficulties," published by the Academy.

COURSE 296

Room 8 A Period W-6 or Th-6

EVERETT R. VEIRS, M.D.
Temple, Texas

External Dacryocystorhinostomy and a Modified Stallard Procedure

A discussion of the diagnosis of tear sac pathology and the indication for operation on the tear sac will be presented. The technic of an external dacryocystorhinostomy will be given in detail, stressing the proper incision, hemostasis, and the proper size and place for the anastomosis. The technic of the Stallard operation on the tear sac will also be given, with particular reference to a modification to keep the new opening patent. The procedure will be illustrated by motion pictures. The treatment of partially stenosed canaliculi will be discussed briefly.

COURSE 297

Room 8 V Period T-4 or Th-4

JOHN P. WENDLAND, M.D.
Minneapolis, Minn.

Chiasmal Lesions

The subject will be introduced by a brief discussion of the anatomy of the chiasmal region. Following this the course will deal with various types of field defects which chiasmal lesions may present. Associated symptoms and specific causes of chiasmal lesions will be discussed next. Emphasis will be placed upon the fact that the responsibility for early diagnosis of lesions in the neighborhood of the chiasm rests primarily upon the ophthalmologist. Cases will be presented illustrating points discussed. Where the patient's lesion was the result of a neoplasm, a diagram of the chiasm and the tumor will be shown and correlated with the visual fields.

COURSE 298

Room 802 Period M-6 or T-6

HORACE WESTON, M.D.
Detroit, Mich.

Clinical Measurement of Astigmatism

The various methods of measuring astigmatism depend upon simple optical principles. Understanding these principles is an aid in taking clinical refraction measurements. The effect of obliquely crossed cylinders will be discussed in relationship to the determination of the astigmatic axis by the retinoscope, cross-cylinder, and astigmatic dial. The proper manipulation of the astigmatic conoid of Sturm will be shown to be the basis for measuring the amount of astigmatism by each of these methods.

COURSE 299

Room 814 Period M-5 or T-5

HAROLD F. WHALMAN, M.D.
Los Angeles, Calif.

Minor Surgical Procedures of the Eye

This presentation comprises the instructor's experience in several ophthalmic operations such as those for papilloma, xanthoma, hemangioma, melanosis, chalazion, pinguecula, pterygium, mucous mem-

brane transplant, accessory lacrimal gland, and lacrimal excretory apparatus.

Securing good local anesthesia easily and safely is as essential to success as is meticulous attention to minute details of procedure, and it will be the endeavor of the instructor to present these practical considerations.

COURSE 300

Room 819 Period W-5 or Th-5

GEORGE N. WISE, M.D.
New York, N. Y.

Fundus Changes of the Optic Nerve Head

The discussion will include the normal disc, its congenital variations and pathological changes. Kodachrome slides of these conditions will be followed by pathological sections of similar lesions. Illustrative cases will be cited.

COURSE 301

Room 819 Period W-6 or Th-6

EVERET H. WOOD, M.D.
Auburn, N. Y.

Macular Lesions: Early Diagnosis and Treatment

The course will consist of a review of the embryology, anatomy and physiology of the macular regions. This will be followed by a discussion of some of the more common infectious, inflammatory and degenerative conditions that affect the macula.

Particular emphasis will be placed on the earliest possible diagnosis and the clinical management of patients with macular disease.

The necessity for considering the individual as a whole, and not simply his local eye condition, particularly in the geriatric patient, will be stressed.

The lecture will be illustrated by slides.

COURSE 302

Room 825 Period M-5 or T-5

JOHN A. EGAN, M.D.
Denver, Colo.

Cross Cylinder Application and Theory

This course will include a description of the use of the cross cylinder as taught by Edward Jackson. Improved models will be shown and additional uses, since Jackson's time, will be described.

Lantern slides will be shown exhibiting its practical application. Large 2-foot models of cross cylinder, trial cylinder and trial frame will be used to demonstrate general technic in refraction. Twelve different uses of the instrument, including the employment of the newer correcting cross cylinder, will be described.

A brief discussion of theories involved, controversial aspects and merit in astigmatism as opposed to other methods will be presented.

HOME STUDY COURSE DISCUSSION PERIODS

These discussion periods are based on the lesson material for each particular subject in the Home Study Course in Ophthalmology. Those attending a discussion period will be provided at the time of the meeting with a copy of the questions prepared for the subject under consideration. The members of the faculty will offer opinions on the clinical application of the questions and will encourage an exchange of ideas.

These discussion periods will be profitable to physicians who desire to review basic subjects and obtain their up-to-date clinical application. They are intended for physicians who have completed or who are taking the Home Study Course in Ophthalmology offered by the Academy. Members of the Home Study Course faculty and others outstanding in their respective fields will be present to answer questions or discuss problems which have arisen from the reading assignments or the monthly questions sent to registrants in the Home Study Course.

Tickets for each discussion period may be purchased individually at $2.00 per hour. The students are urged to bring their problems to the lecture room or to write in advance to one of the faculty members.

HOME STUDY A

Room 8 E Period M-4

Embryology, Anatomy and Neuro-anatomy

Raymond E. Meek, M.D.
New York, N. Y.

John W. Henderson, M.D.
Ann Arbor, Mich.

Joseph H. Krug, M.D.
New York, N. Y.

HOME STUDY B

Room 8 E — Period M-5

Physiology

George P. Guibor, M.D.
Chicago, Ill.

Arthur H. Downing, M.D.
Des Moines, Iowa

Hendrie W. Grant, M.D.
St. Paul, Minn.

HOME STUDY C

Room 8 E — Period M-6

Refraction

Frank W. Newell, M.D.
Chicago, Ill.

Manuel L. Stillerman, M.D.
Chicago, Ill.

HOME STUDY D

Room 8 E — Period T-4

External Diseases, Bacteriology and Virology

James H. Allen, M.D.
New Orleans, La.

S. Rodman Irvine, M.D.
Beverly Hills, Calif.

Samuel N. Key, Jr., M.D.
Austin, Texas

HOME STUDY E

Room 8 E — Period T-5

Perimetry and Neuro-ophthalmology

Cecil W. Lepard, M.D.
Detroit, Mich.

Dan M. Gordon, M.D.
New York, N. Y.

HOME STUDY F

Room 8 E — Period T-6

Extraocular Muscles

Paul T. McAlpine, M.D.
Summit, N. J.

Hunter H. Romaine, M.D.
New York, N. Y.

Conrad Berens, M.D.
New York, N. Y.

HOME STUDY G

Room 8 E — Period W-4

Ophthalmoscopy and Medical Ophthalmology

John P. Macnie, M.D.
New York, N. Y.

W. Banks Anderson, M.D.
Durham, N. C.

HOME STUDY H

Room 8 E — Period W-5

Pathology

John S. McGavic, M.D.
Bryn Mawr, Pa.

HOME STUDY I

Room 8 E — Period W-6

Pharmacology and Therapeutics

Kenneth C. Swan, M.D.
Portland, Ore.

Alfred J. Kreft, M.D.
Portland, Ore.

HOME STUDY J

Room 8 E — Period Th-4, Th-5

Optics and Principles of Biomicroscopy

Arthur Linksz, M.D.
New York, N. Y.

Edwin F. Tait, M.D.
Norristown, Pa.

CONTINUOUS COURSES AND PANEL DISCUSSIONS
OTOLARYNGOLOGY

COURSE 101

Room 8 J Periods T-1, T-2

FRANZ ALTMANN, M.D.
JULES G. WALTNER, M.D.
New York, N. Y.

Histopathology of the Ear with Practical Applications—Part I

A two-period course—$4.00

COURSE 102

Room 8 J Periods W-1, W-2

FRANZ ALTMANN, M.D.
JULES G. WALTNER, M.D.
New York, N. Y.

Histopathology of the Ear with Practical Applications—Part II

A two-period course—$4.00

Courses 101 and 102 are limited to individuals who have taken the Academy course on "Histology of the Ear" or its equivalent. They will be comprised of low and high power study of sections of the temporal bone, covering the common pathologic conditions there encountered. Particular attention will be paid to otosclerosis and related bone diseases as well as to inflammatory and neoplastic diseases. There will be a lantern slide demonstration followed by study of the actual specimens.

COURSE 103

Room 8 R Periods W-2, W-3

LAWRENCE R. BOIES, M.D.
Minneapolis, Minn.

ANDERSON HILDING, M.D.
Duluth, Minn.

O. E. VAN ALYEA, M.D.
Chicago, Ill.

Rhinologic Problems

A two-period course—$4.00

The purpose of this course is to provide an open forum for the exchange of ideas regarding present-day rhinologic problems.

It cannot be denied that the introduction of the first sulfonamide in 1937 and of penicillin in 1942 began a change in our responsibilities toward acute suppuration in the nasal sinuses.

What is our status in 1954?

Rhinologic problems must include a consideration of that modern idea: "The Physiologic Reconstruction of the Nasal Pyramid." How important is this?

Members of the panel will express their ideas. Comment will be urged from participants in the Course.

COURSE 104

Room 8 H Periods T-2, T-3

COURSE 105

Room 8 H Periods W-2, W-3

WILLIAM T. K. BRYAN, M.D.
and
MARIAN P. BRYAN
St. Louis, Mo.
BY INVITATION

Cytologic Pathology in the Differential Diagnosis of Ear, Nose and Throat Diseases

A two-period course—$4.00

This two-hour course is being presented twice, as Course 104 on Tuesday and Course 105 on Wednesday. **Please select course number according to day on which you wish to attend.**

Clinical applications of the recent developments in the cytology of ear, nose and throat diseases will be presented. Exfoliative cytology can aid in the differential diagnosis and pathologic understanding of benign and malignant tumors, radiation changes in tissues, infections, allergy, otitis media and mastoiditis. Intracellular morphology of ciliated columnar epithelial cells in the common cold and in measles and their significance thus far as seen with the Papanicolaou stain will be included. Emphasis will be given to the differential diagnosis by smear of acute and chronic middle ear suppurations. All points of cytology will be illustrated with kodachrome slides taken at high magnification. A resume of adaptable staining technics for exudates in ear, nose and throat will be given. Such patterns of pathologic cytology correlated with clinical symptoms present an awareness of the ever-changing processes of disease. Their use will aid in diagnosis and treatment.

COURSE 106

Room 8 E Periods T-2, T-3

COURSE 107

Room 8 M Periods Th-2, Th-3

SAMUEL COHEN, M.D.
Philadelphia, Pa.

Rhinoplasty Complications

A two-period course—$4.00

This two-hour course is being presented twice, as Course 106 on Tuesday and as Course 107 on Thursday. **Please select course number according to day on which you wish to attend.**

Among the postoperative sequelae that will be discussed are the following: flatness of the lower and anterior surfaces of the nasal tip, lower dorsal hump or excessive concavities, postoperative tip drops, intranasal scarring and adhesions, pinched nostrils, retracted columella, unequal nostrils, chronic lymphatic obstruction, and irregular or wide bony nasal dorsums.

COURSE 108

Room 8 R Periods T-1, T-2

COURSE 109

Room 8 S Periods Th-1, Th-2

JOHN J. CONLEY, M.D.
JOHN F. DALY, M.D.
and
MAURICE LENZ, M.D.
New York, N. Y.
BY INVITATION

Cancer of the Head and Neck: Diagnosis and Treatment

A two-period course—$4.00

This two-hour course is being presented twice, as Course 108 on Tuesday and as Course 109 on Thursday. **Please select course number according to day on which you wish to attend.**

The course includes an analysis of cancers involving all the major systems of the head and neck area. This includes the various types of malignant tumors involving the epithelium, the sinuses, the ear, the lips, the tongue, the buccal mucosa, the palate, the nasopharynx, floor of the mouth, hypopharynx, parotid gland, cervical lymphatics, thyroid gland and cervical esophagus, (larynx intentionally omitted because of its inclusion in other courses). The diagnosis of these various types of malignant tumors will be discussed in the pertinent factors pertaining to the history, physical examination, x-ray and chemical tests and various biopsy technics relative to each case.

A discussion of treatment will include the curative efforts embracing various types of surgery and irradiation and combinations of these two technics. It will also include the worth-while palliative efforts in the management of incurable cancer by surgery, irradiation or combinations of these technics.

COURSE 110

Room 801 Periods T-1, T-2

JOHN MARQUIS CONVERSE, M.D.
New York, N. Y.

Principles of Nasal Plastic Surgery—Basic

A two-period course—$4.00

This course will review the main steps in the typical corrective nasal plastic operation. The course will be illustrated by slides and motion pictures.

COURSE 111

Room 801 Periods W-1, W-2

JOHN MARQUIS CONVERSE, M.D.
New York, N. Y.

Principles of Nasal Plastic Surgery—Advanced

A two-period course—$4.00

This course is more advanced than the preceding one and deals, in addition to the main steps in the typical corrective nasal plastic operation, with conditions such as nasal deviations and saddle nose.

COURSE 112

Room 8 P Periods T-2, T-3

COURSE 113

Room 8 P Periods W-2, W-3

STUART C. CULLEN, M.D.
Iowa City, Iowa
JOHN W. PENDER, M.D.
Rochester, Minn.
BY INVITATION
IVAN TAYLOR, M.D.
Detroit, Mich.
BY INVITATION

Anesthesia for Otolaryngologic Surgery

A two-period course—$4.00

This two-hour course is being presented twice, as Course 112 on Tuesday and as Course 113 on Wednesday. **Please select course number according to day on which you wish to attend.**

The course is designed to encourage and permit the discussion of problems related to anesthesia that are encountered in the practice of otolaryngology. Each of the panel members has had extensive experience in

anesthesia for otolaryngologic surgery, and is prepared to discuss problems and answer questions in this field that may be submitted by the physicians attending the course.

It is expected that there will be problems concerning premedication, the use of cocaine and similar drugs, reactions to depressant and local anesthetic drugs, suitable anesthesia for endoscopic procedures, and the safe use of pentothal sodium and muscle relaxants.

Registrants in the course are encouraged to come to the session prepared to present specific problems of their own for discussion.

COURSE 114

Room 8 G — Periods T-2, T-3

COURSE 115

Room 8 G — Periods W-2, W-3

KENNETH M. DAY, M.D.
Pittsburgh, Pa.

THEODORE E. WALSH, M.D.
St. Louis, Mo.

What Can Be Done For Deafness

A two-period course—$4.00

This two-hour course is being presented twice, as Course 114 on Tuesday and as Course 115 on Wednesday. **Please select course number according to day on which you wish to attend.**

The problems of relieving deafness including the efficacy or failure of various forms of treatment and surgery will be considered. The value of hearing aids and rehabilitation measures for cases which cannot be helped by medical or surgical means will be discussed. The apparent success of quackery will be explained. The members of the course are encouraged to submit questions and actively join in an informal discussion of the subject.

COURSE 116

Room 8 M — Periods W-1, W-2

A. C. FURSTENBERG, M.D.
Ann Arbor, Mich.

JOHN B. ERICH, M.D.
Rochester, Minn.

WILLIAM C. HUFFMAN, M.D.
Iowa City, Iowa

Tumors and Cysts of the Head and Neck

A two-period course—$4.00

This course deals with tumors and cysts of teratologic origin. The occurrence of these lesions in various parts of the head and neck as the result of congenital disturbances of development or the misplacement of embryonal cells is a common example of a few of the mysterious factors pertaining to the genesis of neoplastic growths.

Many notable examples of neoplasms of this nature have been observed in the nose, pharynx, mouth and cervical region. The lesions which are of otolaryngologic interest will be discussed emphasizing certain pertinent clinical data which it is hoped will be of practical value to members of the profession interested in this field. Pathologic studies will be incorporated only to the extent which appears necessary to a clear understanding of the clinical manifestations of the lesions described.

COURSE 117

Room 803 — Periods T-2, T-3

COURSE 118

Room 8 G — Periods Th-2, Th-3

FRENCH K. HANSEL, M.D.
St. Louis, Mo.

Allergy in Otolaryngology: Diagnosis and Treatment

A two-period course—$4.00

This two-hour course is being presented twice, as Course 117 on Tuesday and as Course 118 on Thursday. **Please select course number according to day on which you wish to attend.**

This course is planned to inform the beginner as well as the advanced student in the principles of the practice of allergy in otolaryngology. In general, the discussion will be directed toward the supplies and extracts needed, the technic of performing tests, the preparation of dilutions of extracts and the management of the various problems as presented by the patient.

COURSE 119

Room 8 V — Periods W-1, W-2

COURSE 120

Room 8 W — Periods Th-1, Th-2

WILLIAM G. HARDY, Ph.D.
MIRIAM D. PAULS, Ph.D.
BY INVITATION
Baltimore, Md.

Special Audiometry in Differential Diagnosis

A two-period course—$4.00

This two-hour course is being presented twice, as Course 119 on Wednesday and as Course 120 on Thursday. **Please select course**

number according to day on which you wish to attend.

With infants and preschool children, and with adults whose hearing problems may relate to malingering or psychogenic disorders, special technics must be used to determine the function of the hearing end-organ. Several technics (employing calibrated toys and noise-makers, tuning forks, pure-tone and speech audiometery, masking and the like) will be considered in detail. These range from what is useful in ordinary office practice to procedures involving special facilities.

Particular attention will be given to the technic and problems of psychogalvanic skin resistance (PGSR) audiometry, and demonstrations with unselected subjects will be undertaken. Some details of patient management will be discussed, and there will be consideration of various physiologic problems related to deaf, brain-injured, feeble-minded, disturbed and psychopathologic subjects.

COURSE 121

Room 806 Periods T-2, T-3

GORDON D. HOOPLE, M.D.
Syracuse, N. Y.

RAYMOND E. JORDAN, M.D.
Pittsburgh, Pa.

OLIVER W. SUEHS, M.D.
Austin, Texas

Fluid Ears

A two-period course—$4.00

It is hoped that questions will be asked which will cover the following points: etiology, pathology, diagnosis, prognosis and treatment.

It is anticipated that the discussion will touch on the various aspects of these divisions of this interesting subject.

COURSE 122

Room 814 Periods T-1, T-2

COURSE 123

Room 814 Periods Th-1, Th-2

WILLIAM C. HUFFMAN, M.D.
Iowa City, Iowa

Plastic Surgery of the Head and Neck; General Problems

A two-period course—$4.00

This two-hour course is being presented twice, as Course 122 on Tuesday and as Course 123 on Thursday. **Please select course number according to day on which you wish to attend.**

This presentation deals with a potpourri of general plastic surgery problems about the head and neck. Some of the cases presented are examples of reconstructive surgery done solely for esthetic reasons, but the great majority illustrate problems where plastic surgery was necessary to restore normal function. Some of the principles of flaps and grafts will be mentioned as will some of the problems encountered in handling certain types of malignant neoplasms.

COURSE 124

Room 8 K Periods T-1, W-1, Th-1

CHEVALIER L. JACKSON, M.D.
Philadelphia, Pa.

Peroral Endoscopy: Problems of Technic

A three-period course—$6.00

Consideration of location and character of room suitable for endoscopic clinic. Lighting and other facilities required. Types of table and other furniture. Instrumentarium for various kinds of endoscopic clinics. Anesthesia. Demonstration of position of patients for direct laryngoscopy, bronchoscopy, esophagoscopy and gastroscopy, illustrated by means of motion picture films. Technic of introduction of instrument with especial attention to the principal difficulties and ways of overcoming them. Technic of use of forceps for bronchoscopic biopsy and removal of benign tumors. Technic of electrocoagulation. Technic of catheterization of segmental bronchi. Solution of typical mechanical problems of foreign body extraction.

COURSE 125

Room 800 Periods Th-2, Th-3

V. H. KAZANJIAN, M.D.
Boston, Mass.

JOHN MARQUIS CONVERSE, M.D.
New York, N. Y.

EDGAR M. HOLMES, M.D.
Boston, Mass.

Traumatic Injuries of the Face

A two-period course—$4.00

The symposium on early treatment of facial injuries, held during the first period, will cover:

1. Emergency measures consisting of the control of primary hemorrhage, traumatic shock, and other necessary first aid measures

2. Local examination of lacerations and fractures of the face plus general physical examination
3. Early treatment of soft tissues, primary, and late primary suturing of lacerations, and the immobilization of fractures with special reference to fractures of the nasal, zygomatic and maxillary bones

The second period will be comprised of a symposium on treatment of deformities of the face of traumatic origin, including:

1. Discussion of some general principles of reconstructive surgery of the face
2. Repair of deformities involving soft tissues only
   a. Conspicuous scars without apparent loss of tissue
   b. Defects with definite loss of tissue requiring use of pedicle or skin grafts
   c. Treatment of special areas such as the eyelids, eyebrows, and stenosis of the nasal passages

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COURSE 126

Room 811 Periods W-2, W-3

COURSE 127

Room 806 Periods Th-2, Th-3

JOHN R. LINDSAY, M.D.
Chicago, Ill.

Vertigo: Differential Diagnosis and Treatment

A two-period course—$4.00

This two-hour course is being presented twice, as Course 126 on Wednesday and as Course 127 on Thursday. **Please select course number according to day on which you wish to attend.**

Vertigo caused by a disturbance of the inner ear or the vestibular pathways is differentiated from dizziness of other origins.

This course reviews in detail the essentials of an adequate history and the routine ear, nose and throat and functional examinations, and discusses the interpretations.

A practical classification of vertigo is presented with demonstration by case history of the various causes of vertigo within each group and the appropriate management.

COURSE 128

Room 8 L Periods T-1, T-2

COURSE 129

Room 8 P Periods Th-1,Th-2

RICHARD E. MARCUS, M.D.
Los Angeles, Calif.

JOHN E. BORDLEY, M.D.
Baltimore, Md.

HELMER R. MYKLEBUST, Ph.D.
Evanston, Ill.
BY INVITATION

JACQUELINE KEASTER
Los Angeles, Calif.
BY INVITATION

Hearing Problems in Children

A two-period course—$4.00

This two-hour course is being presented twice, as Course 128 on Tuesday and as Course 129 on Thursday. **Please select course number according to day on which you wish to attend.**

To be presented are (a) methods of diagnosis in the preschool and school-age child, (b) technics available for differential diagnosis, (c) the otolaryngologist and school hearing surveys, including methods of screening, interpretation of results, and treatment, (d) rehabilitative procedures: use of hearing aids, auditory training, speech and lip reading. The material will be presented in symposium form, stressing highlights and practical detail. Each member of the symposium panel will discuss his subject, following which the audience will be invited to participate and questions about special problems will be answered.

COURSE 130

Room 8 L Periods W-2, W-3

COURSE 131

Room 8 L Periods Th-2, Th-3

JAMES W. McLAURIN, M.D.
Baton Rouge, La.

BEN H. SENTURIA, M.D.
St. Louis, Mo.

E. KING GILL, M.D.
Corpus Christi, Texas

Treatment of External Otitis

A two-period course—$4.00

This two-hour course is being presented twice, as Course 130 on Wednesday and as Course 131 on Thursday. **Please select course number according to day on which you wish to attend.**

This year, for the second time, a panel will be presented on the treatment of otitis externa. Since this disease is widely misunderstood, the first fifteen minutes of the allotted time will be spent in brief statements by various members of the panel concerning the classification of the conditions included in

the term otitis externa, the pathologic process, and the principles upon which treatment should be based. These statements are intended only for orientation. The remainder of the allotted time will be occupied by questions and answers and by a general discussion, participated in by all physicians present, on the treatment of diseases of the external ear.

COURSE 132

Room 8 K Periods T-2, T-3

COURSE 133

Room 8 K Periods W-2, W-3

PHILIP E. MELTZER, M.D.
FRANK D. LATHROP, M.D.
MOSES H. LURIE, M.D.
FRANCIS WEILLE, M.D.
Boston, Mass.

Otological Problems

A two-period course—$4.00

This two-hour course is being presented twice, as Course 132 on Tuesday and as Course 133 on Wednesday. **Please select course number according to day on which you wish to attend.**

The time wil be given over for an unprepared discussion with the men taking the course. They are free to participate in a stimulating and informal exchange of views concerning practical everyday problems commonly met with in our practice. The panel will be prepared to discuss all types of treatment and surgery of the ear. The registrants are urged to contribute to the discussion.

COURSE 134

Room 8 V Periods T-1, T-2

COURSE 135

Room 8 V Periods Th-1, Th-2

PAUL J. MOSES, M.D.
San Francisco, Calif.
BY INVITATION

Speech and Voice Therapy in Otolaryngology

A two-period course—$4.00

This two-hour course is being presented twice, as Course 134 on Tuesday and as Course 135 on Thursday. **Please select course number according to day on which you wish to attend.**

Every ear, nose and throat specialist sees in his office a large number of patients with voice and speech problems. Notably, hoarseness without visible organic change is a frequent occurrence. The field of the diseases of speech and of the speaking and singing voice, including the functional and psychosomatic aspects of diagnosis and treatment, should be part of the training of the laryngologist. It is a medical field which should not be handled by the voice and speech teacher without supervision by the otolaryngologist.

This course will concentrate on practical office procedures for the analysis and treatment of disturbance of voice and speech. Acoustic diagnosis will be illustrated by phonograph records. The program comprehends the organic problems of laryngeal diseases: nodes, contact ulcers, paralysis of vocal cords, endocrine changes (mutation and its pathology), re-education of voice after laryngetcomy.

Functional diseases include "professional" voice disturbances, vocal neurosis, persistent falsetto voice, pathology of the singing voice and the vocal pathology of the school child. A voice hygiene program for schools will be outlined.

Pathology and therapy of speech comprises speech development, hearing mutism, functional speech disorders like lisping, stuttering, soft palate problems (paralysis, cleft palate) and aphasia.

This course will emphasize the strictly practical approach to these problems.

COURSE 136

Room 8 E Periods W-2, W-3

COURSE 137

Room 8 E Periods Th-2, Th-3

WERNER MUELLER, M.D.
Boston, Mass.

ARTHUR L. JUERS, M.D.
Louisville, Ky.

SCOTT N. REGER, Ph.D.
Iowa City, Iowa

Hearing Aids

A two-period course—$4.00

This two-hour course is being presented twice, as Course 136 on Wednesday and as Course 137 on Thursday. **Please select course number according to day on which you wish to attend.**

This will be an informal question and answer symposium on hearing aid problems as they arise in daily otologic practice. The participants are invited to submit such questions as:

When does a hard-of-hearing patient need a hearing aid?

What are the comparative merits of bone and air conduction instruments?
What are the limitations of a hearing aid?
Which is the best hearing aid?
How should the patient go about getting one?
What can the otologist do to combat high-pressure salesmanship?

COURSE 138

Room 8 H — Period T-1

COURSE 139

Room 8 H — Period W-1

ROBERT E. PRIEST, M.D.
Minneapolis, Minn.

JOHN A. MURTAGH, M.D.
Hanover, N. H.

HAROLD WRIGHT, Ph.D.
Minneapolis, Minn.
BY INVITATION

Medications for the Otolaryngologist

A one-period course—$2.00

This one-hour course is being presented twice, as Course 138 on Tuesday and as Course 139 on Wednesday. **Please select course number according to day on which you wish to attend.**

The purpose of this course is to allow physicians attending the Academy to discuss questions concerning drugs with these well-known authorities. It is believed that this "Pharmacology Forum" will provide an interesting and profitable hour for those who elect to bring their drug problems to it.

Pathology of the Nose and Throat

MURIEL RAUM, M.D., et al.
Washington, D. C.
BY INVITATION

This nine-period Panel Course has been divided on an anatomic basis into three parts, each of which is a consecutive three-period course. Each course will be given only on the day specified. An individual may select one, two or three courses.

The subject matter for each course will be covered in the form of oral presentations with the aid of lantern slides by the participating pathologists. Inflammatory lesions and neoplasms important to the otolaryngologist will be emphasized and, where possible, their biologic behavior. The normal histology of the region under consideration will be briefly demonstrated and a few pertinent congenital anomalies and malformations included.

The otolaryngologist-moderator will give a 30-minute summation and commentary. This will include certain aspects of the clinical extent and gross pathology of various lesions which the pathologist sees as only a small biopsy; features important in clinical diagnosis and differential diagnosis; the importance of histopathologic diagnosis in relation to therapy.

After the moderator's presentation, audience participation in the form of questions or general discussion will be invited.

COURSE 140

Room 8 U — Periods T-1, T-2, T-3

Pathology of the Nose and Paranasal Sinuses

A three-period course—$6.00

Moderator: FRED Z. HAVENS, M.D.
Rochester, Minn.

Introduction
James E. Ash, Col., USA (Ret.)
Washington, D. C.

Histology
Andrew A. Eggston, M.D.
New York, N. Y.
BY INVITATION

Nonspecific Inflammatory Disease
Werner Mueller, M.D.
Boston, Mass.

Specific Granulomatous Inflammation
Andrew A. Eggston, M.D.

Neoplasms
Muriel Raum, M.D.

COURSE 141

Room 8 U — Periods W-1, W-2, W-3

Pathology of the Pharynx, Salivary Glands, and Neck

A three-period course—$6.00

Moderator: FRANCIS L. LEDERER, M.D.
Chicago, Ill.

Histology, Inflammatory Disease, Etc.
Paul B. Szanto, M.D.
Chicago, Ill.
BY INVITATION

Neoplasms of the Pharynx
Arthur Purdy Stout, M.D.
New York, N. Y.
BY INVITATION

Lesions of the Neck
James E. Ash, Col., USA (Ret.)
Washington, D. C.

Salivary Gland Neoplasms
Arthur Purdy Stout, M.D.

COURSE 142

Room 8 U Periods Th-1, Th-2, Th-3

Pathology of the Larynx, Trachea, Bronchi, and Esophagus

A three-period course—$6.00

Moderator: PAUL H. HOLINGER, M.D.
Chicago, Ill.

Inflammatory Disease, Etc.

James E. Ash, Col., USA (Ret.)
Washington, D. C.

Neoplasms of the Larynx

Arthur Purdy Stout, M.D.
New York, N. Y.
BY INVITATION

Neoplasms of the Trachea, Bronchi and Esophagus

John R. McDonald, M.D.
Rochester, Minn.
BY INVITATION

COURSE 143

Room 8 Y Periods T-2, T-3

E. W. SCHELDRUP, M.D.
Iowa City, Iowa
BY INVITATION

Anatomy of the Neck in the Light of Modern Studies

A two-period course—$4.00

As a guide to the otolaryngologist called upon to do operative work in the neck for an ever-increasing variety of conditions which require surgical intervention, the standard textbook of anatomy leaves a great deal to be desired and cannot be relied upon to give an accurate account of the many structures encountered.

This course is designed to rectify this inadequacy and to present the anatomy of the neck in the light of modern studies. The material to be presented represents the results of personal investigations conducted on several hundred complete neck dissections during the past twenty years and incorporates the many published papers on special aspects of neck anatomy that have appeared in a widely scattered literature during the same period of time. Practical considerations will be the keynote throughout the presentation.

COURSE 144

Room 8 T Periods W-1, W-2

COURSE 145

Room 817 Periods Th-1, Th-2

LYLE M. SELLERS, M.D.
Dallas, Texas

Dizziness, Dysacousis and Disesthesia

A two-period course—$4.00

This two-hour course is being presented twice, as Course 144 on Wednesday and as Course 145 on Thursday. **Please select course number according to day on which you wish to attend.**

The clinical problems of the dizzy patient, with or without disturbances of hearing and head discomfort, form the subject of this course.

It is the desire and the duty of the otolaryngologist to understand these problems and to assist the patient in solving them successfully. This course will help the otologist to accomplish this. To this end the total mechanism involved is explained clearly and in detail: what is its structure, how it functions, what produces dysfunction, how to detect and locate the site and cause of the disturbance and, most important, what to do about it.

By still projections and by motion pictures the clinical tests are demonstrated so that the otologist may perform them in his office. Through actual case reports representing both the simpler and the more difficult problems, the solution of these problems, the appropriate treatment applied and the results obtained are presented and discussed.

COURSE 146

Room 803 Periods W-2, W-3

COURSE 147

Room 803 Periods Th-2, Th-3

ALBERT P. SELTZER, M.D.
Philadelphia, Pa.

A Typical Rhinoplasty

A two-period course—$4.00

This two-hour course is being presented twice, as Course 146 on Wednesday and as Course 147 on Thursday. **Please select course number according to day on which you wish to attend.**

A complete course in a typical rhinoplasty will be described including basic principles, demonstrated by clear illustrations; step-by-step to the postsurgical result. Instruments in detail, including the electric saw, will be presented.

An animated kodachrome motion picture will be presented to demonstrate the typical rhinoplasty. Errors in plastic surgery of the nose will be discussed in detail.

COURSE 148

Room 808 Periods T-1, T-2

COURSE 149

Room 808 Periods W-1, W-2

HERMAN SEMENOV, M.D.
Beverly Hills, Calif.

Current Therapy in Relation to the Applied Pathology of the Ear, Nose and Throat

A two-period course—$4.00

This two-hour course is being presented twice, as Course 148 on Tuesday and as Course 149 on Wednesday. **Please select course number according to day on which you wish to attend.**

This course in applied pathology may be regarded as a clinical-pathological conference in which sufficient time is allowed for questions and discussion, not only of the pathology of each disease but also various methods of treating it. The salient features of the pathology will be clearly demonstrated by means of kodachrome lantern slides, and the important histology of the common, everyday lesions of the ear, nose and throat will be shown in detail. In the discussion that follows each demonstration, diagnostic and therapeutic comments pertaining to the choice of medical and/or surgical management will be entertained. The main purposes of this course, therefore, are practical: (1) to bring our knowledge of pathology up to date, and (2) to provide a solid foundation for time-honored procedures as well as newer methods of therapy. The agenda includes a wide variety of topics: rhinitis and and sinusitis, infection and allergy, cytologic diagnosis of smears, tonsils and adenoids, nasopharyngeal lymphoid tissue, acute and chronic otitis media, otosclerosis and deafness, laryngeal nodes, the pathology of benign and malignant tumors, focal infection and collagen disease.

COURSE 150

Room 800 Periods T-2, T-3

COURSE 151

Room 802 Periods W-1, W-2

GABRIEL TUCKER, M.D.
Philadelphia, Pa.

JOSEPH P. ATKINS, M.D.
Wynnewood, Pa.

WILLIAM LELL, M.D.
Philadelphia, Pa.
BY INVITATION

Esophageal Diseases and Foreign Bodies: Diagnosis and Treatment

A two-period course—$4.00

This two-hour course is being presented twice, as Course 150 on Tuesday and as Course 151 on Wednesday. **Please select course number according to day on which you wish to attend.**

COURSE 152

Room 8 S Periods T-1, T-2

COURSE 153

Room 8 S Periods W-1, W-2

HENRY L. WILLIAMS, M.D.
Rochester, Minn.

BERNARD JUDOVICH, M.D.
Philadelphia, Pa.
BY INVITATION

W. WALLACE MORRISON, M.D.
New York, N. Y.

WILLIAM J. GRACE, M.D.
New York, N. Y.
BY INVITATION

Head Pain

A two-period course—$4.00

This two-hour course is being presented twice, as Course 152 on Tuesday and as Course 153 on Wednesday. **Please select course number according to day on which you wish to attend.**

INDIVIDUAL COURSES — OTOLARYNGOLOGY

COURSE 401

Room 8 F — Period T-1 or Period W-1

LUCIAN W. ALEXANDER, M.D.
New Orleans, La.

The Adenoid Operation

There is no operation in surgery so badly done in such a large percentage of cases as the adenoid operation. A discussion of the many technics, failure in results, postoperative treatment to avoid middle ear infections, the management of adenoid remnants and case histories will be presented.

Kodachrome slides will be used.

COURSE 402

Room 8 M — Period T-1 or Period Th-1

OSCAR J. BECKER, M.D.
Chicago, Ill.

Plastic Surgery of Protruding Ears

An original technic of correcting protruding ears is to be presented. This method has proved highly satisfactory in reproducing the normal contours of the auricle and in setting the ear back to the head at the proper angle.

The anatomy of the external ear, the etiology and pathology of protruding ears, and a historical survey of operative procedures will be included in the discussion.

COURSE 403

Room 8 D — Period T-2 or Period W-2

HENRY H. BEINFIELD, M.D.
Brooklyn, N. Y.

Management of Nasal Hemorrhage

The treatment of nasal hemorrhage can often be very troublesome before one is successful in controlling it. It is only by approaching this problem in a systematic manner that this difficulty can be minimized. A detailed systematic approach for the proper care of such cases in the young and old will be discussed. The importance of reaching a diagnosis of the source of bleeding is stressed for the correct handling of such a condition. A distinction is made between bleeding from the nose which requires no local treatment and nosebleed. Emphasis is placed upon the control of severe postnasal hemorrhage by presenting some special, little used technics. Questions on your personal problems will be answered, time permitting. Reprints of a published article on nasal hemorrhage will be distributed.

COURSE 404

Room 8 C — Period W-1 or Period Th-1

RICHARD J. BELLUCCI, M.D.
New York, N. Y.

Submucous Resection of the Nasal Septum

Surgical anatomy of the nasal septum and framework of the external nose will be reviewed.

A simplified technic for the surgical correction of the deviated nasal septum will be presented as taught at the Manhattan Eye, Ear, and Throat Hospital.

Surgical management of the anterior deviated nasal septum with obstruction of the nares will be presented.

The relative importance of the septum in plastic surgery of the nose will be discussed.

COURSE 405

Room 8 F — Period T-2 or Period Th-2

GUY L. BOYDEN, M.D.
Portland, Ore.

Chronic Frontal Sinus Surgery

A method in which a mucoperiosteal flap is used to make a new opening into the frontal sinus without the use of tantalum or any other foreign body will be discussed.

Slides, a motion picture, and specimens will be used to demonstrate the procedure.

COURSE 406

Room 8 C — Period T-2 or Period W-2

K. C. BRANDENBURG, M.D.
Long Beach, Calif.

Understanding the Problem Patient

The increasing frequency with which the term "psychosomatic" appears at medical meetings and in the literature attests to the growing realization of the importance of

emotional factors in the causation of our patients' complaints. This course will deal with the type of cases in which emotional factors are likely to play an important role and the methods whereby such conditions may be recognized and dealt with.

COURSE 407

Room 8 E — Period T-1 or Period Th-1

FRIEDRICH S. BRODNITZ, M.D.
New York, N. Y.

The Actor and Singer in Ear, Nose and Throat Practice

Singers and actors form a group of growing importance in the practice of the laryngologist. To handle these patients well requires an understanding of the technics of professional use of the voice and of the medical, occupational and psychological problems of the artist.

A review of this field will be presented by dealing with such topics of practical importance as

1. Check-up examination of the vocal organs
2. Technical problems of professional singing and speaking
3. The vocal organs of the artist in infections
4. Evaluation of local treatments
5. Handling of emergencies
6. Judging the fitness to perform
7. Psychology of the artist-patient
8. Differential diagnosis of functional voice disturbances

COURSE 408

Room 8 C — Period T-3 or Period Th-3

HENRY A. BROWN, M.D.
Rochester, Minn.

Chronic Suppurative Otitis Media: Office Treatment

This course will cover the differential diagnosis of the various types of chronic otitis media, including a classification and various methods of treatment. Each type will be presented with a discussion of what one can expect from treatment of the nature which can be carried out in an office.

COURSE 409

Room 8 M or Room 817 — Period T-2 or Period Th-3

NORTON CANFIELD, M.D.
New Haven, Conn.

Audiology for the Practicing Otologist

Based on the experience of examination, diagnosis, treatment and advice for several thousand patients with hearing loss who have sought my attention as an otologist during the past twelve years, a definite management pattern has evolved which provides these patients with a combination of services. Believing that those with impaired hearing can best be managed and advised by an otologist through all phases of their rehabilitation, the material to be presented will emphasize those features of professional attention which are so eagerly sought after by those with impaired hearing. Special attention will be given to those cases for whom the otologist usually is unable to provide specific therapy for improvement of hearing acuity. The services available to the deafened outside of the otologist's office will be discussed. Testing apparatus, including the speech audiometer, and the cooperative help of a trained assistant, will indicate the possibilities for expansion of the otologist's work in the future.

COURSE 410

Room 8 A — Period T-1 or Period W-1

RALPH C. CARPENTER, M.D.
Marshalltown, Iowa

WILLARD F. GOFF, M.D.
Seattle, Wash.
BY INVITATION

Respiratory and Swallowing Problems in the Newborn

The mortality rate in the immediate neonatal period is still quite high in spite of great advancement in obstetric and pediatric management. Asphyxial and deglutitory conditions account for a large percentage of the fatalities, and these conditions may present perplexing problems in differential diagnosis and treatment. Many conditions productive of interference with respiration are irreversible, but there are a substantial number which, if recognized and corrected, will materially aid in the reduction in the number of neonatal deaths. At times the otolaryngologist, because of the scope of his training, may be of material assistance in the diagnosis and management of respiratory and swallowing problems.

A comprehensive survey of conditions producing these abnormalities will be presented and special emphasis will be placed on conditions in the otolaryngologic field.

1. Pulmonary
2. Extrapulmonary

Abnormalities of swallowing to be presented will include tracheo-esophageal fistula and atresia, muscular incoordination of the hypopharynx, cardio-esophageal relaxation, and esophageal obstruction from congenital cardiovascular anomalies.

Various types of resuscitory equipment will be shown, also equipment for aerosolization of detergent aerosols.

COURSE 411

Room 8 A — Period T-2 or Period W-2

CLAUDE C. CODY, M.D.
Houston, Texas

Management of Eustachian Tubal Pathology

Management of eustachian tubal pathology is a subject that confronts every practicing otolaryngologist. The youngest to the oldest physician sees countless numbers of patients with complaints referable to the eustachian tubes. Unfortunately, many difficulties are erroneously attributed to the eustachian tubes when this is not the real seat of trouble.

A working classification of eustachian tubal pathology, suppurative and nonsuppurative, in both the young and old, is offered. In children, kodachrome slides will be shown demonstrating eardrums with various stages of retraction and in various stages of effusion. Relationship to hearing is stressed. Management, including adenoidectomy, myringotomy with suction, inflation, and the possible use of radium and roentgen therapy is covered. Our changing concepts regarding suppurative otitis media and serous otitis media and their relationship to hearing are developed.

In adults, the problem of serous otitis media and adhesive otitis media is dealt with along with their various methods of management.

Vertigo and its possible relation to tubal obstruction is reviewed. Especial emphasis on office management of tubal obstruction, the methods of its diagnosis and treatment will be thoroughly covered. A short motion picture on equipment and technic used in tubal obstruction in routine office practice will be shown.

COURSE 412

Room 811 — Period W-1

SAMUEL COHEN, M.D.
Philadelphia, Pa.

Deviated Noses and Their Correction

Deviated noses are classified into four groups: (1) cartilaginous, (2) bony, (3) combined bony and cartilaginous, and (4) the dislocated septal cartilage.

Preliminary to all corrective procedures, the nasal skin is elevated and the septal cartilage is cut from the columella.

The bony deviation is corrected by removing a bony triangle from the dorsum. The nasal processes are cut and fractured at equal or unequal distances from the inner canthi and moved medially. The removed wedge of bone may be either discarded or, if necessary, reinserted to raise the depressed central bony dorsum.

In cartilaginous deformities, isolated sections of septal cartilage are removed submucously. The upper laterals are cut from the septum and the septal cartilage centralized. Sometimes a dorsal cartilage irregularity must be removed submucously and replaced by a piece of straight septal cartilage.

In the dislocated septal cartilage the mucosa is elevated on one side of the septum and various angles of cartilage are removed. The upper laterals are cut from the septum. The cartilage is elevated from the vomerian floor. The septal cartilage is now centralized and the elevated mucosa replaced. The septal skin is sewn to the columellar skin on each side. Any excess or insufficient upper laterals are now adjusted to the septal cartilage (equalized).

In all these procedures, the perpendicular plate is rarely resected but is usually pushed centrally. Sometimes the vomer is split lengthwise and a section removed before being elevated from the palatal floor. The balance of the vomer is then placed centrally.

Photographs will be shown demonstrating various nasal deviations.

COURSE 413

Room 8 C — Period T-1 or Period Th-2

LESTER L. COLEMAN, M.D.
New York, N. Y.

The Practical Psychosomatic Aspects of Otolaryngology

The interrelationship between emotional experiences and physiologic processes is no longer a speculative one. This relationship is now accepted as a tangible and concrete factor in the perception of disease. The influence of emotional variations on body functions has been recognized and studied with interest in every phase of medicine. The alteration of clinical symptomatology by psychic factors has been repeatedly witnessed by us as otolaryngologists.

The otolaryngologist must have as great an interest in psychobiology and psychopathology as he has in tissue pathology if he is to return his patient to complete serviceability.

The course is designed to orient otolaryngologists to the psychosomatic implications involved in the practical problems of office practice. We will include the psychologic aspects of deafness, fenestration surgery, tinnitus, functional aphonia, nasal plastics and the emotional preparation of children for surgery.

COURSE 414

Room 8 D — Period T-1 or Period W-1

DONALD A. CORGILL, M.D.
McKinney, Texas

Laryngopharyngectomy and Bilateral Neck Dissection

Patients are often seen by the laryngologist for the first time in advanced stages of carcinomatous disease with local metastasis already present. A one-stage surgical procedure encompassing all the malignant tissue together with methods of primary or secondary reconstruction, immediate and long term postoperative courses, complications and methods of dealing with them, will be described by means of color slides and color motion pictures. The utilization of such surgery following irradiation failure will be discussed. Questions are invited.

COURSE 415

Room 8 M — Period T-3 or Period W-3

JAMES B. COSTEN, M.D.
St. Louis, Mo.

Mandibular Joint Syndrome: Differential Diagnosis and Treatment

The recognition of a commonly occurring group of pain reflexes due to abnormal function of the manibular joint is of equal interest to the otolaryngologist, the neurosurgeon and the diagnostician.

The routine examination needed to confirm a diagnosis embraces:

1. Local findings: varieties of malocclusion, loss of teeth, tenderness of mandibular joint to palpation, crepitus within the joints, and trismus.

2. X-ray study to show density changes within the joint, abnormal condylar positions and space relations and erosion of bony landmarks

3. Search for regional conditions which may supply basis for trismus or deranged jaw action

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COURSE 416

Room 8 W — Period T-3 or Period Th-3

KENNETH L. CRAFT, M.D.
Indianapolis, Ind.

Nasal Allergy: Diagnosis and Medical and Surgical Treatment

I. Brief resume of common symptoms of nasal allergy

II. Diagnostic procedures in nasal allergy
- A. History
  Family. Past and present history of patient — subjective symptoms. A thorough history is the most valuable single diagnostic procedure in the examination.
- B. Examination of Nose
  Gross appearance of nasal membranes.
  Contrast with appearance in infection.
- C. Roentgen Examination
  Typical picture.
  Variations.
  Transillumination.
- D. Cytology of Nasal Secretions
  Types of cells found in nasal smear.
  Importance of differentiation.
  Significance of eosinophils.
  Technic.
- E. Hematology
  Interpretation of various cytologic and hematologic tests.
- F. Nasal Polyps
  Always suggest allergy.
  Differentiation between allergic and nonallergic polyps.
- G. Skin Tests
  Patch, scratch, intradermal.
  Choice of allergens to be used in any given case.
  Interpretation and limitation of skin tests.

III. Treatment of nasal allergy
- A. Nonspecific
  1. Local
  2. Systemic
     Internal medication.
     Care of complicating systemic pathology, emotional upsets, etc.
- B. Specific treatment
  1. Prophylaxis
  2. Hyposensitization
     Principles, Indications. Technic.
- C. Surgery in nasal allergy.

IV. Case reports demonstrating points discussed in diagnosis and treatment.

COURSE 417

Room 8 W — Period T-1 or Period W-1

LAWRENCE S. CRISPELL, M.D.
Joplin, Mo.

Diagnosis and Treatment of Allergy in Children

This course is designed as a practical approach to the problems of diagnosis and treatment of allergy in children. Particular emphasis will be placed upon the problem of nasal allergy in children as related to colds, sinusitis, tonsillectomy, adenoidectomy, deafness, and bronchitis.

COURSE 418

Room 8 F — Period T-3 or Period Th-1

JACK DAVIES, M.D.
Iowa City, Iowa
BY INVITATION

Practical Considerations in the Development of the Face and Ear

The development of the face and adjoining areas will be discussed in terms of certain new concepts. The so-called "processes" as usually found in the textbooks are not to be considered as processes in the strict sense of the word but as "mesodermal growth centers." Their growth and mutual fusion is accompanied by filling out of the grooves between them, a process very different from that of the fusion of free processes which involves the apposition and breakdown of intervening epithelial surfaces. The only true process is the palatal process of the maxilla, in whose fusion a true apposition of epithelial surfaces is involved. The implication of these observations in the understanding of congenital facial fissures, macrostomia, defects of lips and palate and of the external and middle ear will be discussed.

Recent experimental observations on the origin of the facial and branchial mesoderm strongly suggest that the neural crest is implicated. Since this important structure is also involved in the development of the cranial nerves and ganglia, a genetic relationship between neural and mesodermal structures is suggested. Correlated neural and mesodermal defects are frequently observed in congenital anomalies in the facial area. This concept will be discussed in general terms in an attempt to encourage a rational approach to the understanding and clinical management of these defects.

COURSE 419

Room 8 F or Room 8 J — Period W-2 or Period Th-2

F. W. DAVISON, M.D.
Danville, Pa.

Use of Antibiotics in Otolaryngology

Treatment of infections, both acute and chronic, is a large part of the practice of every otolaryngologist. In order to give his patient the best available therapy the physician must know the relative merits of all antibiotics, the optimum doses, their mode and frequency of administration, duration of action and their possible toxicity.

The discussion will be limited to practical aspects of antibiotic therapy and will be illustrated by case reports. The material presented is based on an extensive review of the literature as well as the author's experience.

COURSE 420

Room 8 J — Period T-3 or Period Th-3

EUGENE L. DERLACKI, M.D.
Chicago, Ill.

The Role of Allergy in Deafness

The purpose of this course is to emphasize the role of nasal and aural allergy as an important cause of impaired hearing. Many cases of middle ear deafness are the result of an allergy of the eustachian tube with a secretory otitis, or an allergy of the tubal and middle ear mucosa with a chronic suppurative otitis or recurring acute otitis. In contrast, only a few cases of nerve deafness are the result of allergic labyrinthine hydrops.

Since most allergic pathology is reversible, the most effective management of such allergic cases and the prevention of permanent damage to the hearing result from the early recognition and adequate control of the allergic factors. This will be achieved only when the otolaryngologist learns to make his own allergic diagnostic studies and carries out his own allergic management. Illustrative examples of allergic deafness and its management will be presented.

COURSE 421

Room 8 P — Period T-1 or Period W-1

DAVID D. DeWEESE, M.D.
Portland, Ore.

The Problem of the Dizzy Patient

This course will attempt to cover the evaluation of the patient who comes to the physician's office with the complaint of dizziness. Some time will be spent with the classification from a symptomatic point of view with particular reference to history. The practical value of audiometer and office caloric tests will be mentioned. Various accepted treatments which have been proved of value will be discussed. Certain aspects of different types of nystagmus will be covered. The approach to this discussion will be primarily that of the practicing clinician.

COURSE 422

Room 8 J — Period W-3 or Period Th-1

JOHN B. ERICH, M.D.
Rochester, Minn.

Fractures of the Facial Bones

This course deals with fractures involving the mandible, maxilla, malar and nasal bones. The methods of treatment which have been found most effective at the Mayo Clinic will be stressed, and classifications which facilitate the management of some of these traumatic injuries will be discussed.

COURSE 423

Room 803 — Period W-1 or Period Th-1

HERBERT S. FRIEDMAN, M.D.
BY INVITATION
BELA MARQUIT, M.D.
White Plains, N. Y.

Grafts, Bone and Cartilage in Plastic Surgery of the Nose and Face

Grafts, bone and cartilage, autogenous and homogenous, in rhinoplasty and reconstructive facial surgery for congenital, traumatic and postoperative defects will be discussed. The course will include a short summary of recent bone and cartilage bank technics.

COURSE 424

Room 8 Y — Period T-1 or Period W-1

LUDWIG A. FURCHGOTT, M.D.
Dallas, Texas

Hearing Disorders in All Age Groups: Complete Diagnosis and Management in Office Practice

With greater understanding of the physiology and pathology of hearing and equilibrium, the means of arriving at accurate diagnoses have become more varied, *seemingly* more complex, but actually more fundamental. Because of the apparently changing approach to the problem, there has been an understandable reluctance on the part of otologists to change their equipment to meet every new concept. Consequently the publicly supported Speech and Hearing Center has to some extent become a focal point for the management of hearing disorders. It is the duty of the practicing otologist to equip and staff his office in such a manner that he is capable of coping with the patients who come to his office with complaints of hearing loss.

A two-room installation embodying the above will be described and illustrated in detail. The performance of the tests, which are not complex and which can be performed with equipment that should be found in the office of every modern otologist, is demonstrated and the application of the findings to differential diagnosis and to complete and rational management will be discussed and documented by case histories.

COURSE 425

Room 825 — Period W-3 or Period Th-3

ARAM GLORIG, M.D.
Los Angeles, Calif.

The Otolaryngologist and Hearing Aid Selection

The purpose of the course will be to answer many of the questions surrounding hearing aid selection; especialy those which the "hearing loss patient" directs to the physician when he is informed that a hearing aid will be necessary.

COURSE 426

Room 808 — Period W-3 or Period Th-3

JOSEPH L. GOLDMAN, M.D.
New York, N. Y.

Vasomotor Rhinitis: Diagnosis and Treatment

This course will deal with the common, nonatopic, hypersensitive type of rhinitis. Diagnostic features of vasomotor rhinitis as differentiated from infectious rhinitis will be

presented, stressing newer bacteriologic and cytologic criteria. Indications for the methods of therapy will be discussed.

COURSE 427

Room 4 A or Room 802 — Period T-3 or Period Th-3

VICTOR GOODHILL, M.D.
Los Angeles, Calif.

Management of Tinnitus

The patient with tinnitus is frequently a distressing problem to the otologist. The multiple organic causes of tinnitus and the complex psychosomatic patterns encountered make it impossible for any one approach or therapy to alleviate this problem.

A broad psychodynamic approach and certain limited specific therapeutic measures will do much to clarify this confused otologic issue.

A systematic orderly method of analysis is presented as a guide to diagnosis and as a plan for the management of the patient with tinnitus.

COURSE 428

Room 802 — Period T-2 or Period Th-2

HENRY M. GOODYEAR, M.D.
Cincinnati, Ohio

Maxillary Sinus Disease: Important Observations in Medical and Surgical Treatment

The maxillary sinuses are the largest and most frequently concerned in the treatment of all the nasal sinuses. They are also the most satisfactory to treat. Infection of a maxillary sinus never occurs without some involvement of the ethmoid cells. The course will cover definite procedures used in the treatment of children; the fallacy of frequent irrigations; the limitation of antibiotics used locally; and the question, "Shall the membrane be completely denuded in surgery of the maxillary sinus?"

COURSE 429

Room 8 F or Room 8 D — Period W-3 or Period Th-3

J. W. HAMPSEY, M.D.
Pittsburgh, Pa.

Sinusitis in Children

While the clinical picture of sinusitis in children does not differ essentially from that in adults, the inability of the child to accurately describe his symptoms necessitates a greater reliance upon objective findings. The appearance of the nasal mucosa and the microscopic study of nasal and sinus secretions are the principal means of diagnosing and following these cases. X-rays in children are less reliable than in adults because of the thickness of the bones of the face. There are three general types: the allergic, the infectious, and the combination of the two. Effective treatment will include allergic management as well as control of infection. A re-evaluation of the tonsil and adenoid problem may be desirable in the light of these advances.

COURSE 430

Room 8 C or Room 8 D — Period W-3 or Period Th-2

FRED HARBERT, M.D.
Philadelphia, Pa.

Clinical Audiology

This course is designed to emphasize the application of basic audiology and recent research to clinical testing. The indication for and interpretation of standard and special audiometric tests will be outlined with special emphasis on masking and recruitment.

The diagnosis of various types of deafness will be illustrated by lantern slides showing results of tests on clinical cases. Methods of predicting and correlating speech reception loss from audiograms will be discussed.

COURSE 431

Room 808 — Period T-3 or Period Th-1

JAMES A. HARRILL, M.D.
Winston-Salem, N. C.

Bronchography

The indications, contraindications, technic and complications of bronchography in adults and children will be discussed. A technic used with adults, showing positioning of patient and x-ray views taken, will be demonstrated by motion pictures. The various pathologic lesions demonstrated by bronchography will be discussed using illustrative cases.

COURSE 432

Room 810 — Period T-3 or Period W-3

HERBERT H. HARRIS, M.D.
Houston, Texas

Poliomyelitis: Management of Respiratory Complications

While the recognition and value of tracheotomy in the management of respiratory

poliomyelitis has been accepted by the profession at large, in most cases the establishment of an airway has been left to the otolaryngologist. The establishment of this airway is only a minor part, and the otolaryngologist should be in a position to offer more assistance in the management of these problem cases.

COURSE 433

Room 816 — Period T-3 or Period Th-3

LeROY D. HEDGECOCK, Ph.D.
Rochester, Minn.
BY INVITATION

Clinical Audiometry

A review will be given of hearing tests that go beyond the basic audiogram and yet fall within the scope of practical office procedure. The technics of administering the various tests and the methods of recording results will be presented, with a rationale of each procedure. An attempt will be made to point out the relationship of one test to another, and of each to the basic air and bone thresholds. The importance of taking a composite picture as the basis for evaluation and interpretation will be emphasized.

COURSE 434

Room 810 — Period T-1 or Period W-1

HAROLD L. HICKEY, M.D.
Denver, Colo.

Tumors of the Nasal Septum

This course will consist of a discussion of tumors of the nasal septum in a broad sense so as to include any condition which may cause proliferative swelling of the septum. Thus we shall consider benign and malignant neoplasms, also infectious granulomas. The incidence, clinical course and management will be correlated with gross and micropathology. Ectochrome color slides of pathologic sections will be shown to illustrate the various lesions.

COURSE 435

Room 8 R — Period W-1

JEROME A. HILGER, M.D.
St. Paul, Minn.

Direct Fixation of Facial Fractures

Facial fractures are frequently extremely complex and varied. In almost all instances, however, they are reducible to relatively simple terms. Their realignment and fixation can be accomplished by a variety of satisfactory and acceptable methods. As a basic principle to the solution of the individual problem, simplicity of the method should be the basic theme. Frequently, this simplicity is best obtained by direct wire fixation of the component fragments. To accent and elaborate some of the simple, direct approaches is the purpose of this hour.

COURSE 436

Room 8 R — Period T-3 or Period Th-3

JEROME A. HILGER, M.D.
St. Paul, Minn.

Therapeutic Approaches to the Inner Ear

Two decades ago salient contributions to the pathology of inner ear deafness were made. Within the past decade the pathology of advanced hydrolabyrinth was added. It was attributed to a single disease entity (Meniere's disease, endolymphatic hydrops or other synonyms).

As medical knowledge of neurovascular change and endocrine imbalance increases it becomes increasingly clear that inner ear vertigo and deafness do not have a single genesis; that the labyrinthine pathology, even that of hydrops, does not denote a single etiology; and that therapy, useful only in the formative stage, must vary to meet the cause. A stereotyped therapeutic approach must inevitably be futile in a disorder of multiple etiologies.

The causes and treatment of some of these inner ear malfunctions will be discussed.

COURSE 437

Room 801 — Period T-3 or Period W-3

FREDERICK T. HILL, M.D.
Waterville, Maine

Antro-Alveolar Fistulas

While many antro-alveolar fistulas may respond to conservative measures, at times the management of this condition may tax the ingenuity of the specialist. Control of any infection of the maxillary antrum is essential and, in early cases, may suffice, allowing spontaneous closure of the fistula. In cases of longer duration some plastic procedure usually will be required. The type of operation should be determined by the conditions present in each case. The technic of the reversed flap plastic, applicable to large defects, will be demonstrated.

COURSE 438

Room 8 A — Period T-3 or Period W-3

RAYMOND L. HILSINGER, M.D.
Cincinnati, Ohio

Vascular Headaches: Diagnosis and Treatment

In the far past all complicated headaches were considered migraine. In the more recent past, since the work of Horton, Wolff and Friedman, much has been done to classify the various types of vascular headaches. However, the pendulum as usual has swung too far to the other side and now there is far too much classification. If this continues, each little cranial artery will have its own headache syndrome.

This course will attempt to make a very simple classification with general diagnosis and treatment, discussing both vasodilating and vasospastic headaches. Both the symptomatic and prophylactic aspects of treatment will be considered.

COURSE 439

Room 802 or Room 4 A — Period T-1 or Period W-3

PAUL H. HOLINGER, M.D.
Chicago, Ill.

Pediatric Laryngology

In this course the management of diseases of the larynx in infants and children will be presented. Beginning with methods of examination, the important technics of x-ray visualization will be discussed with particular attention directed toward the roentgen interpretation of etiology and site of respiratory obstruction. The problems of direct laryngoscopy will be considered, with a discussion of diagnostic and therapeutic technics. A resume of congenital and acquired lesions of the larynx in infants and children will be shown by means of slides and color motion pictures.

COURSE 440

Room 802 — Period W-3 or Period Th-1

EDGAR M. HOLMES, M.D.
Boston, Mass.

Scars of the Face

The appearance of a scar depends upon several factors, such as its location, the instrument causing the break in the skin, the amount of trauma, presence of foreign bodies, and the inherent healing qualities of the individual. Such factors will be considered in dealing with both traumatic and surgical cases, points being emphasized which will minimize scarring. In traumatic wounds we must accept the location, but in surgery we may choose the site in many individuals which will leave the least disfigurement. The talk is illustrated with color slides.

COURSE 441

Room 8 E or Room 8 D — Period W-1 or Period Th-1

ROBERT M. HOSLER, M.D.
Cleveland, Ohio
BY INVITATION

Cardiac Arrest: Emergency Treatment in the Operating Room

Cardiac arrest in the operation room is the enigma and challenge of present-day surgery and anesthesia. Obviously the best therapy for this catastrophe is in its prevention; however, to be successful in meeting this challenge when suddenly confronted with it, one must know reflexly the things to do and the thing not to do. (One is just as important as the other.) One does not have time to improvise methods, as a time limitation of three to five minutes must be overcome.

Practical, precise, and detailed methods will first be presented concerning the reestablishment of the oxygen system. Secondly, the methods of restoration of the heart beat in cardiac standstill and ventricular fibrillation will be presented. These are the two conditions which are met in the operating room.

A colored motion picture will demonstrate these procedures and the Rand-Beck defibrillating machine will be on exhibition.

COURSE 442

Room 4 A or Room 8 T — Period W-1 or Period Th-1

HOWARD P. HOUSE, M.D.
Los Angeles, Calif.

Surgery of the Chronically Discharging Ear

The indications for surgical intervention and the operation of choice in the chronically discharging ear will be presented.

A detailed description of the surgical technic used in both the modified and the radical mastoid operation will be given. The necessity of a definite detailed pattern of surgical approach in these cases will be emphasized. Many points of practical value

in mastoid surgery which will aid in preventing undue surgical complications will be presented. The postoperative management of these cases will be reviewed.

This course in chronic ear surgery will be fully illustrated by slides and kodachrome motion pictures.

COURSE 443

Room 4 A — Period W-2
or
Room 8 T — Period Th-2

HOWARD P. HOUSE, M.D.
Los Angeles, Calif.

Atresia of the Ear Canal: Congenital and Acquired

The indications for surgical intervention in congenital and acquired ear canal atresia cases will be discussed in detail.

The surgical technic of operating upon congenital atresia cases will be described in detail and illustrated by a motion picture.

The management of acquired atresia of the ear canal has not always been satisfactory. A surgical technic to re-establish an adequate ear canal in these cases will be described in detail.

The postoperative care end results which may be expected will be presented.

COURSE 444

Room 8 W — Period W-3
or
Room 8 A — Period Th-3

LELAND G. HUNNICUTT, M.D.
Pasadena, Calif.

The Chronically Congested Nose

The chronically congested nose is more common in highly civilized peoples. Part of the treatment is to eliminate some of the conditions and medications that go along with civilization.

The congestion may be from emotional states, fatigue, environment, local and general disease, and improper care of the nose. Experimental studies will be shown on the proper and improper care of the nose. Most chronically congested noses can be helped by the methods outlined.

COURSE 445

Room 814 — Period W-1
or
Period Th-3

PERCY E. IRELAND, M.D.
Toronto, Ont., Canada

Common Sense Treatment of the Office Patient

The office practice in our specialty is not filled with the glamorous cases of textbook diseases. The largest number of patients consult a specialist for assurance and relief from the catastrophes of life. His responsibilities are far reaching and rest heavily on his shoulders.

This course will chiefly discuss, in a frank manner, how we may sort out the psychosomatic patient from those who have organic lesions requiring our skill and medical knowledge. The pitfalls which we may fall into will be fully considered, as well as the shortcuts to assessment which are so necessary in the life of a busy practitioner of our specialty.

COURSE 446

Room 816 — Period T-1
or
Period W-1

FORDYCE A. H. JOHNSON, M.D.
Pasadena, Calif.

Adult Tonsillectomies Using Pentothal Sodium, Curare, Pontocaine and Novocain as the Anesthetic

A technic is presented for tonsillectomies, on patients 14 years and older, which gives the surgeon an additional choice of anesthetic. Pentothal sodium is being used more extensively, is known to most patients, and is here presented so that it can be adapted to throat surgery with less danger to the patient and greater ease in operation by the surgeon. The lecture will be illustrated by a colored motion picture. There will be a question and answer period.

COURSE 447

Room 825 — Period W-1
or
Period Th-1

ARTHUR C. JONES, M.D.
Boise, Idaho

Helpful Hints for Everyday Practice

1. The training of a receptionist is most important regardless of the number of doctors in the office.
2. The appearance of interest and the "overdose" of unnecessary delays.
3. Gentleness in examination.
4. Precautions before using cocaine.
5. Care in using Auline Oil in 10 per cent cocaine for eardrum anesthesia.
6. Demonstration of the Trowbridge middle ear aspirator for aero-otitis.
7. Demonstration of a nonsurgical device for the relief of collapsed alae.
8. The use of 30-gauge hypodermic needle to prevent discomfort in local anesthesia. Especially advocated for use on children.

9. Treatment of early head colds.

10. The cause and treatment of hypertrophic rhinitis.

11. The cause and treatment of certain types of ear secretions.

12. The advisability of keeping photographic records in all types of plastic surgery.

13. Demonstration of a padded clothes pin for the emergency treatment of nasal hemorrhage.

14. The advisability and reasons for frequent metabolism tests.

COURSE 448

Room 810 — Period T-2 or Period Th-2

LESTER T. JONES, M.D.
Portland, Ore.

Tear Sac Surgery: The Intranasal Approach and New Methods for Use in Complicated Cases

As a basis for this study a series of 160 consecutive operative cases will be used. The standard intranasal dacryocystorhinostomy will be demonstrated by a motion picture and slides.

In cases without a tear sac two new methods will be shown:

(1) Canaliculorhinostomy, in which the blind nasal end of a usable canaliculus is dissected free and held open by packing or tubing until epithelialization is completed.

(2) Conjunctivorhinostomy, in which a nasal mucosal flap is demonstrated to make a lining for the ostium between the conjunctival sac and nasal cavity. This is used in cases without both tear sac and usable canaliculi.

Special emphasis will be given to the handling of failures resulting from previous external or internal tear sac surgery. The use of polyethylene tubing will be discussed.

The "lacrimal pump," the "dye test," and the "canaliculus test" will be described and their importance to the cure of epiphora shown.

COURSE 449

Room 816 — Period W-2 or Period Th-2

LEWIS W. JORDAN, M.D.
Portland, Ore.

Nasal Fractures:
Management by the Rhinoplastic Approach

Recent advances in rhinoplasty by otolaryngologists for the improvement of nasal function have directed attention to more precise methods for the handling of nasal fractures. The proper management of this condition will prevent much later disabiilty.

This course will present a practical approach to the management of the fractured nose. It will include: (1) methods of making an early diagnosis; (2) use of local anesthesia; (3) discussion of pathology; (4) correction of displaced bony fragments; (5) reduction of septal fractures; (6) open reduction in cases which cannot be corrected by closed methods; (7) application of external and internal dressings; (8) discussion of nasal injuries in children; and (9) discussion of old fractures.

COURSE 450

Room 825 — Period T-1 or Period Th-2

RAYMOND E. JORDAN, M.D.
Pittsburgh, Pa.

Allergy in Otology

An analysis of 727 consecutive otologic patients revealed that 27 per cent had otologic conditions caused or complicated by allergy. From this survey it is apparent that allergy has a definite role in the practice of otology. Allergy was found in 85 per cent of the patients with chronic secretory otitis media. Persistent discharge in simple types of chronic suppurative otitis media and postoperative modified or radical mastoidectomies can be caused by an allergy. Certain types of tinnitus will respond to allergic management. Some cases of Meniere's disease will respond to minimal subcutaneous doses of histamine and therefore can be considered in the allergic category. The above conditions will be discussed from the standpoint of signs, symptoms, local treatment and allergic management.

COURSE 451

Room 825 or Room 817 — Period T-2 or Period W-1

ARTHUR L. JUERS, M.D.
Louisville, Ky.

Clinical Application of Modern Hearing Tests

The practical office application of recent advances in speech and pure tone testing will be discussed. Particular stress will be placed on the following aspects of the problem: (1) interpretation of audiometric curves; (2) speech testing in office routine; (3) use and abuse of masking; (4) correlation of newer tests with old fundamentals.

Test results taken from clinical records will be used to illustrate various points.

COURSE 452

Room 814 — Period T-3 or Period W-3

JACQUELINE KEASTER
Los Angeles, Calif.
BY INVITATION

Speech and Hearing in Children Under Five Years of Age

Discussion in this course will include the following points:

1. The normal development of speech in young children, including the babbling period, the development of words and sentences, with time devoted to standards of articulation considered to be within the normal range
2. Speech retardation and its possible causes
3. Diagnostic procedures, including tests of hearing appropriate for the evaluation of hearing acuity in young children
4. Indications for training, including the use of hearing aids with borderline as well as severe hearing losses.

COURSE 453

Room 810 — Period W-2 or Period Th-1

W. FRANKLIN KEIM, JR., M.D.
Newark, N. J.

The Management of Parotid Tumors

Discussion of the types of neoplasms encountered in the parotid gland with kodachromes to illustrate the surgical attack on these tumors, including exposure of the facial nerve. Special attention will be given to the treatment of recurrent mixed tumors in which previous treatment by radiation or surgery has failed.

COURSE 454

Room 816 — Period T-2 or Period Th-1

JOSEPH I. KEMLER, M.D.
Baltimore, Md.

Focal Infections of the Upper Respiratory Tract

The doctrine of focal infection has not been completely proven by scientific method; hence, we must evaluate the concept on clinical evidence alone. The objections raised against this evidence are thoroughly discussed, namely, (1) that patients do get well spontaneously and (2) that others do not respond or are made worse by the removal of their foci of infection. The foci of infection in the upper respiratory tract are enumerated. The treatment of these foci of infection is discussed in detail. The author will relate his own as well as the experience of others taken from literature on diseases cured by the elimination of foci of infection.

COURSE 455

Room 809 or Room 800 — Period T-3 or Period W-3

CHARLES E. KINNEY, M.D.
Cleveland, Ohio

Hearing Impairments in Children

Accepted methods of conducting a successful "School Hearing Conservation Program" will be presented. This will include screening, otologic diagnosis and follow-up. An analysis of the findings in about 4,000 cases over the past nineteen years will be presented. The changing nature of children's hearing problems will be pointed out.

The author's ideas about therapy in these cases will be outlined. This will include (1) neglected surgery of the middle ear and mastoid, (2) middle ear effusion, and (3) when to recommend a hearing aid, lip reading and auditory training.

COURSE 456

Room 825 or Room 810 — Period T-3 or Period Th-3

HEINRICH G. KOBRAK, M.D.
Chicago, Ill.

The Treatment of Middle Ear Deafness

Various types of middle ear deafness will be demonstrated by colored photographs of the eardrum in conjunction with the audiogram. The structural changes responsible for the functional loss will be pointed out. A simple classification of middle ear deafness is given.

The physiology of sound conduction is demonstrated by a motion picture which shows the acoustic vibrations of the ossicles, the phase relation at the two windows, and the final acoustic-oscillation at the cochlear partition. The therapeutic possibilities of re-establishing, at least in part, a functioning sound conduction system are outlined.

The surgical operations for the treatment of post inflammatory middle ear deafness now being developed abroad and in this country will be discussed.

The use of prosthetic appliances in the tympanic cavity will be demonstrated. The selection of patients, the technic of fitting and the audiometric results will be shown in a motion picture.

COURSE 457

Room 812 — Period W-2 or Period Th-2

CLAIR M. KOS, M.D.
Iowa City, Iowa

Clinical Significance of Inflammatory Perforations of the Ear Drum

The position of an inflammatory perforation of the eardrum is significant of the extent of pathology, the prognosis and indicated therapy. A study of such lesions after meticulous removal of debris should suggest the general course of management. Initial treatment should be as atraumatic as possible in order to ascertain the degree of viability of diseased tissues and the reversibility of the inflammatory process. The principles of management are concerned with (1) conservation or restoration of hearing, (2) irradication of infection, and (3) control of complications. The basic symptoms of a diseased ear are pain, discharge, hearing loss and vertigo. Any rational therapeutic approach to these symptoms should be predicated on reasonable prospects of issuing the desired relief in accordance with as accurate an assessment as possible of the magnitude of destruction and potential repair. Social, economic and personality factors frequently arise to influence any course of management.

COURSE 458

Room 816 or Room 808 — Period W-3 or Period Th-2

FRANK M. LASSMAN, Ph.D.
Minneapolis, Minn.
BY INVITATION

The Prescription of Hearing Aids

The purpose of this course is to provide the information, rationale, and method for making an effective recommendation of a hearing aid to meet the specific needs of the specific patient. The otologist can and should make a more differentiated recommendation in modified prescription form dealing with the following hearing aid and usage elements:

1. Gain, expressed in battery voltage
2. Maximum output, with specific reference to recruitment
3. Acoustic response, expressed by tone setting, receiver, etc.
4. Ear choice
5. Air conduction vs. bone conduction receiver
6. Type of earmold

Attention will also be given the following questions:

1. Who should and who should not be instructed to wear a hearing aid?
2. Transistor vs. non-transistor instruments
3. Preliminary auditory training

COURSE 459

Room 803 or Room 801 — Period T-1 or Period Th-3

FRANCIS L. LEDERER, M.D.
Chicago, Ill.

Diagnostic Approaches and Recent Trends in Otolaryngologic Practice

We have a tremendous heritage of otolaryngologic states, the fundamental diagnosis of which has not changed with the advent and preparation of newer drugs. The treatment and management have, however, been materially aided by increased evaluation of preoperative risk, improved preoperative preparation and postoperative management.

Otolaryngology bears a kinship to each field of medicine. The specialist in the field recognizes the challenge of the symptom-rich areas of the head and neck which house all of the special senses. He must have the awareness that patients are persons and as such, the specialist must be in a position to assess them in terms of the total organism, not as a single disturbed function.

COURSE 460

Room 812 — Period T-1 or Period Th-3

FRANCIS E. LeJEUNE, M.D.
New Orleans, La.

The Technic of Intralaryngeal Surgery

This is a continuation of the course given several years ago on Suspension Laryngoscopy.

The first phase to be dealt with for successful intralaryngeal surgery is that of anesthesia; the type as well as the technic will be discussed in detail.

Consideration will be made of benign growths, including hemangiomas, polyps, papillomas, cysts and simple edema or hydrops of the cords, accompanied by a motion picture showing the technic.

A discussion will be held on leukoplakia and its removal, early malignancy of the cords and the procedure of removal which has given the best results.

Finally the procedure of intralaryngeal arytenoidectomy will be considered.

COURSE 461

Room 800 — Period W-1 or Period Th-1

JULIUS LEMPERT, M.D.
New York, N. Y.

Office Methods for Diagnosing Type of Hearing Loss and Degree of Correctable or Noncorrectable Physiologic Hearing Function Present in a Given Deafened Ear

Clinical methods of differentiating between middle ear, inner ear, and combined middle and inner ear deafness will be demonstrated. Methods of eliciting a correct history in deafness, and correlating the history with the audiometric findings, will be given. Methods of obtaining the correct subjective and objective responses in testing hearing with the use of tuning forks will be discussed. The course will also include: Methods of finding the degree of physiologic hearing function still existing in a given deafened ear, by correlation of the history with the audiometric reading and the tuning fork tests; practical methods of reaching conclusions as to whether the hearing loss in a given deafened ear is correctable or not.

COURSE 462

Room 8 S — Period T-3 or Period W-3

JULIUS LEMPERT, M.D.
New York, N. Y.

Temporal Bone Surgery: The Anatomic and Functional Considerations

Safest methods of exposing to view the surgical anatomy during the performance of temporal bone surgery will be demonstrated. The functional considerations which must be given to the surgical anatomy involved in performing various surgical procedures on the temporal bone will be discussed.

COURSE 463

Room 8 A — Period Th-1

ROBERT B. LEWY, M.D.
Chicago, Ill.

Direct Laryngoscopy: Newer Technics, Gear Power, Leverage, and Preoperative Management

This course will be a combined lecture, demonstration and discussion. It will include a motion picture that illustrates a position for direct laryngoscopy that eliminates the use of head holders, either human or mechanical. This film also shows the use of the detachable leverage laryngoscope holder that is used in conjunction with the standard laryngoscope spatulas.

Particular emphasis will be laid upon the common problems of the strength required to expose the anterior commissure and get adequate exposure in the heavy-set patient. The subject of adequate relaxation and relaxant drugs will be dealt with in some detail, including the shortcomings of almost all of them. Newer antidotes for the use of higher morphine and demerol dosages will be discussed, and corresponding changes in morphine and demerol technics.

COURSE 464

Room 8 A — Period Th-2

ALFRED T. LIEBERMAN, M.D.
Baltimore, Md.

Histopathology of Hearing Impairments

This course is designed to portray histopathologic aspects of various types of hearing impairments, and will be illustrated by ante-mortem audiograms and photomicrographs of serially sectioned temporal bones from the collection of the Otological Laboratory of the Johns Hopkins Hospital. Included in the presentation are examples of acute and chronic suppurative otitis media and mastoiditis; "adhesive" types of middle ear changes; otosclerosis; nerve type deafness of various kinds.

COURSE 465

Room 8 G — Period T-1 or Period Th-1

PERRIN H. LONG, M.D.
Brooklyn, N. Y.
BY INVITATION

Sulfonamides and Antibiotics in the Treatment of Infections of the Respiratory Tract: Current Observations

With the development of new sulfonamides and antibiotics and because of the multiple and increasing claims which are made for their effectiveness in treating infections of the upper respiratory tract, the otolaryngologist frequently finds himself at sea in respect to the choice of antibacterial agents for the treatment of infection. In this course, an attempt will be made to delineate the uses of the various sulfonamides and antibiotics and special attention will be paid to the toxic reactions produced in patients by single or multiple usage of sulfonamides and antibiotics.

COURSE 466

Room 8 L — Period W-1 or Period Th-1

JAMES H. MAXWELL, M.D.
Ann Arbor, Mich.

Tumors of the Face and Neck in Infancy and Childhood

Minor irregularities in the embryonic growth pattern produce anomalies which rather frequently are manifested in infants and children as soft tissue tumors and cysts of the face and neck. It is with such teratologic lesions that this discussion is concerned primarily.

Grouped according to their anlagen, lesions derived from (1) the vascular system, (2) the nervous system, (3) the branchial structures, (4) the thyroglossal duct, and (5) faults in midline fusion will be discussed in regard to their differential diagnosis and treatment. Lantern slides illustrating the various lesions will be shown.

COURSE 467

Room 8 W — Period T-2 or Period W-2

J. B. McBEAN, M.D.
Rochester, Minn.

The Management of Severe Nosebleed

A description of the blood supply of the nasal cavity will be presented, together with a review of types of treatment used in patients hospitalized for severe epistaxis, including ligation of the external carotid and anterior ethmoid arteries.

COURSE 468

Room 812 — Period W-1 or Period Th-1

W. J. McNALLY, M.D.
Montreal, Que., Canada

Labyrinthine Tests

This course is designed to present the basic or elementary facts which are necessary for an understanding of clinical labyrinthine tests. Much of the time will be taken up in studying the actual methods of carrying out the various tests. Time will also be given to working out the interpretation of reactions which follow the simple tests. The simplicity of the tests will be stressed because they can be made very complex. As a brief introduction, the anatomy and physiology of the semicircular canals and the otoliths will be reviewed. The examination of spontaneous phenomena will be considered. Guides for the detection of spontaneous nystagmus will be given. An interpretation of past-pointing tests and their relation to vestibular stimulation will be studied. The technic of performing the caloric and rotation tests will be taken up in detail. The rules which govern labyrinthine reactions will be used to interpret the results of these tests. Finally, the significance of the results of the tests in labyrinthine and intracranial diagnosis will be investigated.

COURSE 469

Room 814 or Room 8 Y — Period W-2 or Period Th-2

RALPH J. McQUISTON, M.D.
Indianapolis, Ind.

Endaural Radical Mastoidectomy for Chronic Mastoiditis

The types of mastoid disease which require radical surgery will be discussed and a practical method of teaching the technic of radical mastoidectomy will be presented.

The presentation will be illustrated by slides showing the various types of endaural incisions used to expose the mastoid process and the middle ear; a safe approach to the mastoid antrum; the horizontal, posterior, and superior semicircular canals; the course of the facial nerve; the ossicles; and the other vital structures of the middle ear. A safe technic for eradicating the infection in these regions will be presented. The use of skin grafts and postoperative care will be discussed.

This type of surgery, using the high-speed motor-driven burr and with magnification, gives the surgeon his best opportunity to remove the pathologic condition completely and cure the patient of his chronic mastoid disease.

COURSE 470

Room 812 — Period T-3 or Period W-3

ALDEN H. MILLER, M.D.
Los Angeles, Calif.

Laryngeal Emergencies in Infants and Children

This course will be a practical presentation of the diagnosis and treatment of conditions causing dangerous obstruction of the larynx and trachea in infants and children.

The acute obstructive infectious diseases of the larynx, supraglottic or subglottic, cause most emergencies, and a brief differential diagnosis and outline of treatment will be given.

A number of less common conditions are frequently presented to the otolaryngologist for immediate diagnosis and treatment. Of these the following will be discussed.

A. Newborn and infants
   1. Laryngomalacia (congenital laryngeal stridor)
   2. Glossoptosis and micronathia
   3. Tumors, trauma, paralysis
   4. Dyspnea due to tracheal compression by mediastinal tumors or anomalies as distinguished from atelectasis, bronchiolitis, agenesis, etc.

B. Children
   1. Bulbar poliomyelitis
   2. Head injuries
   3. Fracture of the larynx
   4. Foreign bodies and caustic burns
   5. Angioneurotic edema

COURSE 471

Room 819 — Period T-1 or Period W-1

S. C. MISSAL, M.D.
Cleveland, Ohio

Technic and Interpretation of Skin Tests in Allergy

COURSE 472

Room 802 or Room 801 — Period T-3 or Period Th-1

PAUL M. MOORE, JR. M.D.
Cleveland, Ohio

Eustachian Tube Problems

Anatomy and physiology. Relationship to the nasopharynx, nose, and sinuses. Factors influencing efficiency of function. Obstruction of the eustachian tube and its various sequelae. Conductive deafness, secretory catarrh, aero-otitis, vertigo, otitis media. The patulous eustachian tube. This condition is commonly overlooked. Its diagnosis and treatment will be stressed.

COURSE 473

Room 806 or Room 8 H — Period W-1 or Period Th-3

LEWIS F. MORRISON, M.D.
San Francisco, Calif.

Laryngeal Paralysis: Cause and Treatment

COURSE 474

Room 8 L or Room 8 S — Period T-3 or Period Th-3

C. STEWART NASH, M.D.
Rochester, N. Y.

Occupational Deafness

More and more the problem of noise in industry and its accompanying occupational deafness is becoming a problem of concern to labor, industry and the public economy.

Some equitable method of handling this problem must be devised. Doctor Nash will present some of his personal experiences in this field of industrial deafness and will endeavor (a) to discuss up-to-date developments as they are occurring at the time of the lecture; (b) to present to the class information with which all otologists managing cases of occupational deafness should be familiar.

COURSE 475

Room 819 — Period T-2 or Period W-2

HARRY NEIVERT, M.D.
New York, N. Y.

The Workshop for Deformed Instruments

Every surgeon who uses instruments should be able to keep them in good working condition. Particularly he should not have to send them out to be sharpened and be annoyed by the long delay in their return. A simple positive method will be taught, one that anyone can learn.

Many other details on the care of instruments will be shown, and there will be an exhibit of a number of practical instruments to increase efficiency in technic.

Those taking the course should bring with them all types of cutting instruments, knives, scissors, curets, chisels, even household knives. They will learn which ones need expert mechanic's attention and which can be repaired in a few minutes with the "Neivert Steel Whittler."

COURSE 476

Room 8 T — Period T-3 or Period Th-3

JOSEPH H. OGURA, M.D.
St. Louis, Mo.

Laryngectomy and Neck Dissection

The technic of the one-stage widefield laryngectomy combined with a radical neck dissection in one block will be detailed on serial lantern slides to demonstrate the most efficient way for the removal of the primary malignancy and its metastasis.

The importance of the sequence of steps in the procedure, conservation of bleeding, and preservation of as much function as possible will be emphasized.

The basis of the selection of cases for surgery will be discussed. Case illustrations will be given.

A motion picture illustrating the technic will also be shown.

COURSE 477

Room 806 — Period T-1 or Period Th-1

HENRY B. ORTON, M.D.
Newark, N. J.

Surgical Considerations of the Neck

COURSE 478

Room 8 T or Room 8 H — Period T-2 or Period Th-2

SAMUEL J. PEARLMAN, M.D.
Chicago, Ill.

Important and Annoying Ear, Nose and Throat Complaints in Old Age

While there are few specific diseases of the aged, there are conditions present in all ages, which in later life are often annoying, persistent, and tend on occasion to be unendurable.

A partial catalog may run as follows: dry mouth, burning tongue, postnasal drip, fissures about the corners of the mouth and in the nasal vestibuli, early carcinoma of the pharynx, leukoplakia, crusting conditions in the nose including atrophic rhinitis, itching ears, head noises, vertigo and senile deafness. An attempt will be made to point out the important features of these complaints and to indicate, when possible, satisfactory modes of treatment.

COURSE 479

Room 806 or Room 8 H — Period W-3 or Period Th-1

HENRY B. PERLMAN, M.D.
Chicago, Ill.

Serous Otitis

Fluid in the middle ear may be found with a number of different clinical conditions. Examples of these various clinical states will be presented together with kodachrome slides of the associated tympanic membrane changes. Drum changes associated with complete filling of the middle ear will be demonstrated. Experiences with serous otitis media in a group of children will be analyzed. The role of the eustachian tube in this disease will be discussed and motion pictures of the tube in action will be shown.

COURSE 480

Room 806 or Room 8 P — Period W-2 or Period Th-3

JOEL J. PRESSMAN, M.D.
Los Angeles, Calif.

Partial Laryngectomies

The course will consist of a discussion of the rationale of partial laryngectomies for cancer, together with an outline of the technic of hemilaryngectomy as recommended by Hautant. The indications for and surgical technic of a subtotal laryngectomy designed to preserve the normal airway and described as "laryngoplasty" will be presented in detail. The procedure is indicated in selected cases not suitable for hemilaryngectomy or extended laryngofissure. Anatomic specimens demonstrating the various stages of the larynoplasty procedure will be available for study.

COURSE 481

Room 807 or Room 801 — Period W-1 or Period Th-2

F. JOHNSON PUTNEY, M.D.
Philadelphia, Pa.

Surgery of Neck Tumors

The practical aspects of surgery of benign and malignant neoplasms of the neck, excluding the thyroid and larynx, are presented. Epidermoid tumors of the neck are diagnostic problems and it is always necessary to search elsewhere about the head and neck for primary lesions before definitive surgical treatment of the neck lesions. The surgery of metastatic cervical nodes is discussed in detail with emphasis on the technic of radical neck dissection.

COURSE 482

Room 4 A or Room 815 — Period T-2 or Period W-2

AUBREY G. RAWLINS, M.D.
San Francisco, Calif.

ACTH, Cortisone and the Antihistaminic Drugs

Physiology of the pituitary adrenal axis
- Adrenal steroid hormones (simple classification)
- Cortisone (Compound E)
- Cortisone (Compound F)

ACTH
1. Possible modes of action of these hormones
2. Discussion of connective tissue in reference to ear, nose and throat disease

3. Indications and contraindications for the use of ACTH and cortisone
4. Rationale of using ACTH and cortisone simultaneously
5. Common things to watch while giving ACTH and cortisone

Antihistaminics (classification)

1. Has antihistaminic power but main action may be as antihyaluronidase drugs
2. Should be looking for better antihyaluronidase drugs
3. Discussion of the known antihyaluronidases and antihistaminics
4. Indications and contraindications for use of antihistaminics and antihyaluronidase drugs

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COURSE 483

Room 800 Period T-1

SCOTT N. REGER, Ph.D.
Iowa City, Iowa

Practical Office Audiometry

This course will consider (1) the common sources of error in audiometry; (2) an adequate testing procedure; (3) the use of masking while obtaining air and bone conduction measurements; and (4) interpretation of audiograms.

COURSE 484

Room 812 Period T-2

SCOTT N. REGER, Ph.D.
Iowa City, Iowa

Detection of Auditory Malingering in Office Practice

This course will consider (1) the legal status of the expert witness; (2) relationships between the ear history, physical examinations, vestibular and hearing tests; and (3) demonstration of certain specific unilateral and bilateral hearing tests.

COURSE 485

Room 807 Period T-1
or
Period Th-1

LYMAN G. RICHARDS, M.D.
Brookline, Mass.

Helpful Suggestions Concerning Office Practice

1. Reception of the patient
   a. Waiting room arrangements
   b. Receptionist technic
   c. Secretarial contact
   d. Arrangement of consulting room
   e. Treatment rooms
   f. Cashier contact
2. Treatment room fixtures, chair, cabinets, compressed air suction
3. Methods of anesthesia
4. Technics of specific examinations
   a. Larynx examination
   b. Nasopharyngeal examination: transillumination
   c. Antrum irrigations
   d. Audiometric setup
   e. Tubal catheterization
   f. Minor operative procedures such as nasal polypectomy, myringotomy, turbinal cauterization
   g. Physiotherapy with diathermy
   h. Remainder of time for discussion of common therapeutic problems, such as otitis externa and postnasal catarrh
   i. Role of psychosomatic approach in otolaryngology

COURSE 486

Room 819 Period T-3
or
Period Th-3

HERBERT J. RINKEL, M.D.
Kansas City, Mo.
BY INVITATION

Food Allergy in Otolaryngologic Practice

I. History Taking. A resume is given of the cardinal symptomatic patterns which indicate the possible existence of food allergy together with cross questions to either repudiate or substantiate this possibility.

II. Diagnostic Methods. A survey of the relative accuracy of skin tests, feeding tests, diet charts, and clinical studies.

III. Therapeutic Procedures for Food Sensitive Patients. This will be a resume of the clinical handling, advice, information, and procedures to be followed to improve the patient who is food sensitive. Particular stress will be paid to those features which the busy practitioner can use when he is not equipped to carry out minute details due to limitations of space or trained assistants.

COURSE 487

Room 807 Period T-3
or
Period Th-3

GILBERT J. ROBERTS, M.D.
Pomona, Calif.

The Management of Nasal Fractures

Nasal fractures all too frequently are dealt with hurriedly and inadequately, leaving an unsatisfactory cosmetic and functional result.

A clear understanding of the anatomy of the external nose, particularly the relationship between the bony nasal arch and the cartilaginous structure, is essential to the successful management of nasal fractures.

A technic permitting deliberate manipulation under adequate local anesthesia, followed by adequate splinting, inside and out, will be presented, accompanied by lantern slides and demonstration of instruments and splints.

COURSE 488

Room 8 Y or Room 8 R — Period W-2 or Period Th-2

J. M. ROBISON, M.D.
Houston, Texas

Allergic Sinusitis: Treatment

During this course, the various factors which condition the sinal mucosa for the occurrence of allergic sinusitis and the pathologic changes which occur in the sinal mucosa during the various stages of allergic sinusitis will be discussed. Particular attention will be directed to those clinical symptoms which precede, or accompany, the progress of allergic sinusitis, such as perennial allergic rhinitis, recurrent purulent sinusitis, bronchial asthma, pulmonary emphysema, and eosinophilia.

The indications and contraindications for the treatment of maxillary sinusitis by irrigation, polypectomy, and other surgical procedures will be considered. The use of balloons in the treatment of maxillary sinusitis will be described, and the indications for their insertion through an intransasal antrotomy will be given. Also, the selection of cases and indications for opening the maxillary sinus through the canine fossa during the insertion of balloons will be emphasized.

COURSE 489

Room 807 — Period W-3 or Period Th-2

ROBERT E. RYAN, M.D.
St. Louis, Mo.

Headache: Differential Diagnosis and Treatment

The differential diagnosis and the treatment of various types of headache are presented. Among those discussed are migraine, histaminic cephalalgia, sinusitis, myalgia, tension headache, psychogenic headache, hypertensive headache, post-traumatic headache, ocular, otic and the mixed type of headache problem.

The results obtained with various new preparations for these headache patients are shown; many of these are still in the investigative stage, while others have been on the drug market for only a short period of time. The prophylactic and the symptomatic phases of these types of headache problems are both discussed.

The history taking of the headache patient is outlined along with the routine examination procedure.

COURSE 490

Room 807 — Period T-2 or Period W-2

SAMUEL SALINGER, M.D.
BERNARD M. COHEN, M.D.
Chicago, Ill.

Septum Correction and Rhinoplasty: A Combined Procedure

In this course we are describing the technical details of a procedure we have been following for several years which has yielded satisfactory results in the vast majority of cases. It is aimed particularly at the type of case in which the pyramid is out of line and the septum is deviated into a scoliotic position. This may occur with or without a dislocation of the free border of the septum. It is accomplished without removing the lower portion of the septal cartilage either temporarily for reinsertion or permanently.

COURSE 491

Room 800 or Room 8 K — Period W-2 or Period Th-2

LeROY A. SCHALL, M.D.
Boston, Mass.

Cancer of the Nose and Sinuses

The instruction hour will be spent in a summary of the cases treated between 1930 and 1935 with an analysis of the end results.

The symptoms of cancer of the nose and sinuses will be discussed and cases illustrative of these symptoms will be presented.

The principals of treatment and the operative approach will be considered.

COURSE 492

Room 809 — Period W-2 or Period Th-2

ALFRED SCHATTNER, M.D.
New York, N. Y.

Rhinoplasty by Reassembly of Nasal Elements

A new concept in rhinoplasty, based on a reassembling of the nasal elements rather than a sacrifice of their structure, will be

presented. A technic will be described which introduces mechanical precision into the orthodox procedure, now largely dependent for its success on a trial and error experience. The operation, in principle and technic, has been given sufficient trial to justify its recommendation.

COURSE 493

Room 819 — Period W-3 or Period Th-2

E. W. SCHELDRUP, M.D.
Iowa City, Iowa
BY INVITATION

Autonomic Neuro-anatomy of the Head and Neck

There is an increasing awareness of the participation of the autonomic nervous system in various symptom complexes throughout the body and in the head and neck especially. Vasomotor disturbances, secretory disturbances, alterations of muscular function, and pain of obscure origin and bizarre patterns of distribution implicate the autonomics acting either locally or at a distance. Success or failure of surgical or pharmacologic attacks on the autonomic nervous system to alleviate such conditions is in large part determined by our understanding of the basic anatomy and physiology of this system in general and of its distribution to any given structure in particular. This lecture is designed to review the basic anatomy and physiology of this system and to point out some of those structures in the head and neck which, on the basis of our present knowledge of the autonomic distribution to the part in question, are either sufficiently or insufficiently understood to warrant operative procedures designed to interrupt their autonomic supply. A brief review of the pharmacology of the autonomic nervous system will be included. The lecture will be illustrated by lantern slides.

COURSE 494

Room 8 T — Period T-1

HARRY P. SCHENCK, M.D.
Philadelphia, Pa.

Physiology of the Lymph Tissue of the Upper Respiratory Tract

Increasing experimental evidence in support of the plasma cell theory of antibody formation demands a re-evaluation of the lymph tissue masses at the chief portals of entrance to the body. The significance of the histologic characteristics of this lymph tissue is discussed in the light of recent investigations. Criteria for determining the limits of physiologic structure are suggested.

COURSE 495

Room 809 or Room 819 — Period T-1 or Period Th-1

HAROLD F. SCHUKNECHT, M.D.
Detroit, Mich.

The Differential Diagnosis of Perceptive Deafness

The anatomy and physiology of the perceptive hearing system will be described. A review will be made of differences in the clinical manifestations of lesions involving the sensory organ, spiral ganglion and higher centers. Auditory tests from patients in each group will be presented and discussed.

COURSE 497

Room 809 — Period W-1 or Period Th-1

ALBERT P. SELTZER, M.D.
Philadelphia, Pa.

Plastic Surgery of Nose, Abrasion of the Face And Face-Lift Operation: New Concepts and Technic

Plastic Surgery of the Nose

The lecturer will discuss the technic in nasoplastic surgery, including basic principles, demonstrated by clear illustrations, starting from the selection of instruments, anesthetic, and step-by-step procedure to the postsurgical result. He will talk on the anatomy of the nose together with the technic in the use of new instruments (original). Esthetic nasal surgery will be discussed in detail. Elimination of fixity of facial expressions, grafts and their preparation, the unsuccessful operation, its causes and prevention, will also be discussed. Errors in plastic surgery of the nose will be discussed in detail.

Face-Lift Operation

Several new instruments and materials for use in this operation will be demonstrated.

An animated kodachrome motion picture will be presented describing a "typical rhinoplasty." Time permitting, the lecturer will discuss details of the face-lift operation with particular emphasis on facial paralysis and operation for esthetic purposes.

The Abrasion Operation

There are many instances in which a person is disfigured by pockmarks and pits as the result of various childhood diseases,

acne, and traumatic tattoos. This condition can be corrected by the abrasion operation. The surgeon employs carpenter's sandpaper of various grit, obtained from any hardware store. This sandpaper is used to abrade the face vigorously. The abraded surfaces are then dried and covered with vaselinized gauze. The technic of this operation will be described in full.

COURSE 498

Room 4 A — Period T-1
or — or
Room 8 R — Period Th-1

GEORGE E. SHAMBAUGH, JR., M.D.
Chicago, Ill.

Practical Office Routine in Otologic Problems

COURSE 499

Room 8 G — Period W-1
or — or
Room 8 F — Period Th-3

BENJAMIN H. SHUSTER, M.D.
Philadelphia, Pa.

Vestibular Apparatus: Clinical Considerations

The anatomy, physiology and pathology of the inner ear and its pathways will be briefly outlined. The resulting symptoms of nystagmus, vertigo and ataxia will be discussed. Differentiation of lesions of the labyrinth from intracranial ones will be considered. Practical application, clinically, will be emphasized.

COURSE 500

Room 8 D — Period T-3
or
Period W-3

GEORGE A. SISSON, M.D.
Syracuse, N. Y.

Carcinoma of Head and Neck: Basic Surgical Principles

The practical anatomy required in order to perform effective radical head and neck surgery is outlined. The technic of a basic radical neck dissection as performed at the Manhattan Eye, Ear and Throat Hospital for the control of metastatic disease is described in detail. The extending of this procedure to include the various primary lesions so that "en bloc" or continuity radical surgery might be performed is illustrated by color slides and short scenes from motion pictures.

Particular attention is paid to the following sites of primary lesions: the larynx, the thyroid, the cervical esophagus, the floor of the mouth, the tongue, the alveolar process and the lip. The surgical technic used to control mixed tumors and malignancies of the parotid is described. The radical resection of the maxilla, an operation for the control of malignancies of the paranasal sinuses, is illustrated.

COURSE 501

Room 8 V — Period T-3

EMANUEL M. SKOLNIK, M.D.
Chicago, Ill.

Cleft Palate: Relationship to Otolaryngology

This course is designed to examine and discuss recent trends and practices in meeting the complex needs of the cleft palate patient. Habilitation through the use of a clinical team as it functions in the Cleft Palate Center of the University of Illinois will be described. The place of prosthetic and of surgical treatment will be examined in terms of the anatomic and physiologic disturbances that are characteristic of this disability. The conduct of the otorhinolaryngologic care of cleft palate patients with chronic otitis media, hearing impairment, upper respiratory infections, the tonsil and adenoid problem, and nasal deformities will receive special emphasis.

COURSE 502

Room 8 V — Period W-3
or
Period Th-3

WAYNE B. SLAUGHTER, M.D.
Chicago, Ill.
BY INVITATION

Congenital Deformity of the Ear with Surgical Correction of Lop Ear

A discussion of the embryology of the external ear, and its relationship to the configuration of the "normal" ear, will be outlined. The anatomy of the so-called normal, or average, ear will be reviewed. The surgical approach to the more simple type of congenital ear defects, described as *"lop ears,"* will be presented. The variety of problems encountered in this defect will be discussed in light of variation of the surgical technics necessary.

COURSE 503

Room 809 — Period W-3
or
Period Th-3

JOSEPH A. SULLIVAN, M.D.
Toronto, Ont., Canada

Facial Paralysis and Bell's Palsy

The surgical anatomy of the seventh nerve will be briefly reviewed as it pertains to

temporal bone surgery. The differential diagnosis between an upper and lower motor neuron lesion will be emphasized.

The various causes of facial nerve paralysis will be enumerated. Instrumentation with the temporal bone will be so depicted as to demonstrate the method of avoiding injury to the facial nerve. The likely sites for injury will be demonstrated as a result of experience gained over many years.

Various methods of repair, end-to-end apposition, the interposition of a nerve graft, the rerouting of the nerve, how to handle a paralysis as a result of fracture to the base of the skull, will all be included.

The use of a fresh or degenerated nerve graft, still a question of doubt in many minds, will be clarified. The problem of Bell's palsy will be emphasized strictly from the otologic point of view. If time permits, the presentation will be terminated by a motion picture in color.

COURSE 504

Room 811 — Period T-1 or Period Th-1

WILLIAM C. THORNELL, M.D.
Cincinnati, Ohio

Intralaryngeal Arytenoidectomy in Bilateral Vocal Cord Paralysis

Various external operations have been described for the correction of bilateral abductor vocal cord paralysis. This course will deal with the intralaryngeal approach for arytenoidectomy which has been successfully applied in cases of bilateral abductor vocal cord paralysis. The surgery is carried out through the Lynch laryngeal suspension apparatus under combined local and intravenous pentothal sodium with curare.

The various modifications that have been introduced as well as complications to be considered will be discussed. Lantern slides will be used to demonstrate the technic of operation, and recordings of the voice taken before and after surgery will be presented.

COURSE 505

Room 815 — Period T-3 or Period W-3

F. R. TINGWALD, M.D.
Cleveland, Ohio

Maxillary Sinus Disease: Management Including Surgical Technics

In the past it has been shown that radical surgical management of maxillary sinus disease has left much to be desired. The swing of the pendulum is now in the opposite direction so that the medical management of maxillary sinus disease is being overemphasized, particularly from the allergic and antibiotic standpoints.

Treatment of various diseases of the maxillary sinus will be covered with special emphasis on the surgical indications and technics involved.

COURSE 506

Room 811 — Period T-3 or Period Th-3

G. EDWARD TREMBLE, M.D.
Montreal, Que., Canada

Practical Therapeutics in Office Practice

In this course a number of common conditions encountered every day by otolaryngologists will be discussed.

1. Nasal obstruction due to engorged or hypertrophied inferior turbinates and treatment outlined.
2. Methods of shrinking the posterior tips.
3. The conservative treatment of sinusitis in view of our present knowledge.
4. A safe and simple method of irrigating the sphenoid sinus. This is important in cases of optic neuritis. A six-minute colored film clearly shows a few important measurements and instruments used in this procedure.
5. External otitis is a common complaint. Treatment has changed considerably in the past ten years. The modern concept appears to be that various strains of Pseudomonas aeruginosa (Bacillus pyocyaneus) are the causative factors in most cases. This will be dealt with and the infrequency of fungous infections mentioned. The relative merits of the current antibiotics will be described and a number of suggestions given which have proven of value in these difficult cases.
6. The tonsil and adenoid problem—our present-day concept. This subject will be touched upon in the light of recent knowledge and, if time permits, the indications and contraindications for the operation. The general conditions most likely to be improved and the time to operate will also be given.

COURSE 507

Room 815 — Period T-2 or Period Th-3

KURT TSCHIASSNY, M.D.
Cincinnati, Ohio
BY INVITATION

Simplified Concepts and Tests of Labyrinthine Function

Routine clinical examination of the vestibular apparatus depends mainly on testing

the function of the semicircular canals. Our concepts in this concern are based on the law of Flourens and the three laws of Ewald. The former simply indicates that each semicircular canal is responsible for reaction movements in its own plane. The latter, however, are rather complicated and even confusing. They are derived from Ewald's pressure experiments on the fenestrated semicircular canals, showing the differences in the strength and direction of the reaction movements when caused either by ampullopetal or ampullofugal endolymph flow. The effects of this flow in the horizontal and the vertical canal were the reverse of each other. A revised and more simple form of Ewald's laws will be presented by regarding endolymph movements relative to the side of the head instead of to the ampulla. Justification for this changed viewpoint will be supported by means of a simple diagrammatic model. Simple experiments on perrotatory nystagmus in the normal individual will show the predominance of visual over labyrinthine factors. The possible application of the perrotatory nystagmus as a test for differentiation between hysterical blindness and complete organic blindness and amblyopia will be discussed. A simple method of a minimum caloric test will be demonstrated.

COURSE 508

Room 8 Y — Period Th-1

O. E. VAN ALYEA, M.D.
Chicago, Ill.

Embryology of the Ear, Nose, and Throat

I. Embryonic Stage

During the first eight weeks of intrauterine life, the structures which compose the ear, nose, and throat are in the formative stage of development. The major changes which take place at this time will be considered step by step by means of lantern slides and wax reconstructions.

II. Fetal Stage

The changes which occur from the eighth week are of especial interest to the otolaryngologist. In this course considerable time will be devoted to the study of serial sections made from fetal heads of various ages with special emphasis on those periods which deal with the origin and development of the nasal sinuses.

III. Congenital Defects

These occur largely as a result of growth defects in the early formative stages of the embryo. Anomalies of the various types encountered in clinical practice will be studied by means of lantern slide projections of charts, x-rays, photographs and specimens from the cadaver.

COURSE 509

Room 817 — Period T-3

O. E. VAN ALYEA, M.D.
Chicago, Ill.

Modern Management of Chronic Sinusitis

Persistence of a sinus infection implies inadequate drainage. Factors contributing to drainage impairment may be local or systemic. The local factors may be anatomic or pathologic in nature and in some cases the sinusitis is maintained by a combination of contributing causes.

The goal of the rhinologist is to eliminate the causative factors while treating the infection.

Seldom is the radical removal of sinus mucosa in the treatment of sinusitis indicated, and it should be instituted with the knowledge that only temporary relief may be expected and that a return of the symptoms, even more pronounced than formerly, may result.

ALUMNI DINNERS

A number of Alumni Dinners are planned for the evening of September 20, at the opening of the Fifty-Ninth Annual Meeting of the Academy. Most groups are scheduling their dinners at 6:30 p.m. in order to attend the evening of diversion in the Grand Ballroom of the Waldorf-Astoria Hotel, which opens at nine o'clock.

Mr. C. C. Philippe, Executive Sales Manager of the Waldorf-Astoria Hotel, will assist secretaries of the various alumni groups to arrange for their dinners, whether they are held in the Waldorf-Astoria or elsewhere. The Waldorf-Astoria will accommodate as many groups as possible on a priority basis. Any choice of hotels or restaurants outside the Waldorf-Astoria should be indicated.

In this course the technics of various therapeutic measures used successfully in the management of sinus disease will be discussed in detail.

COURSE 510

Room 809 or Room 8 T — Period T-2 or Period W-3

HANS VON LEDEN, M.D.
Chicago, Ill.

Dissection in Continuity

Dissection in continuity refers to the combined resection of a malignant tumor and its related lymphatics en bloc. This principle finds wide applications in cancer surgery of the head and neck. Combined operations have been used successfully for carcinoma of the mouth, salivary glands, pharynx, larynx, and thyroid.

Indications for dissection in continuity will be discussed. The surgical technic of a combined operation will be demonstrated with a colored motion picture. Operative results will be reviewed.

COURSE 511

Room 811 — Period T-2 or Period Th-2

FREDERICK A. WILSON, M.D.
Hempstead, N. Y.
BY INVITATION

Otoplasty for Protruding Ears

A simplification of existing technics for the correction of protruding ears as developed on the plastic surgery service of the Manhattan Eye, Ear and Throat Hospital. The anatomy, types of deformity and technic will be illustrated by slides and a motion picture.

COURSE 512

Room 815 — Period T-1 or Period Th-1

De GRAAF WOODMAN, M.D.
New York, N. Y.

Extralaryngeal Technics for Glottic Obstruction

1. Open approach to arytenoidectomy for bilateral abductor paralysis
2. Corrective operation for laryngeal stenosis
3. Treatment of laryngeal web

Discussion of the above problems will be supplemented by slides and kodachrome sound track motion pictures.

COURSE 513

Room 817 — Period T-1 or Period W-2

WALTER P. WORK, M.D.
San Francisco, Calif.

Technics in Wide Field Laryngectomy

This course is designed primarily for those persons who are in training in otorhinolaryngology and for those who have shown some interest and aptitude in neck surgery.

The detailed step-by-step technics in wide field laryngectomy will be emphasized by means of lantern slides and colored motion pictures. The approach to surgery of this region of the neck will be further stressed according to fascial planes and pertinent anatomic structures as worked out using fresh cadaver material, cross section studies, and technics and procedures in the operating room. The low collar incision which the author uses will be illustrated.

The historical development of this operation will be given and full acknowledgement credited to those surgeons who have been instrumental in developing various technics in wide field laryngectomy.

COURSE 514

Room 817 — Period T-2 or Period W-3

SIDNEY K. WYNN, M.D.
Milwaukee, Wis.

Facial Injuries: Primary and Secondary Plastic Repair

The recognition of early intensive therapy for the care of acute severe facial injuries is becoming more apparent over the past years due to the increasing use of the automobile and the mechanization of industry. An all too common belief is that plastic repair of the severe facial injury is something that could or should wait for several days following injury. It is definitely much better to institute plastic repair as soon as one possibly can, depending upon the general condition of the patient following the injury.

The basic principles in the general plastic repair of acute severe facial injuries will be discussed with the illustration and discussion of specific technics in care of certain facial injuries.

COURSE 515

Room 815 Period W-1 or Period Th-2

JUDAH ZIZMOR, M.D.
New York, N. Y.
BY INVITATION

Roentgen Diagnosis in Otolaryngology: A Brief Survey

In the field of otolaryngology, roentgen examination plays an important and often indispensable role in the diagnosis of pathology.

Interesting films will be presented to illustrate the roentgen manifestations of infections, allergies and neoplasms, both benign and malignant in the nose, accessory nasal sinuses, mastoids, pharynx, esophagus, larynx, trachea, and bronchi.

This survey of roentgen diagnosis in otolaryngology is necessarily brief. The more interesting examples of otolaryngologic pathology will be stressed.

HOTEL RESERVATIONS

The Fifty-Ninth Annual Meeting of the American Academy of Ophthalmology and Otolaryngology will be held at the Waldorf-Astoria Hotel in New York City, September 19 to 24, 1954. This meeting will follow the New York sessions of the XVII International Congress of Ophthalmology, which will be held September 12 to 17 with headquarters in the same place. Requests for hotel reservations for both meetings should be sent to Dr. Wendell Hughes, Chairman of the Housing Committee, 500 Park Avenue, New York 22, N. Y.

The Following are Condensed Schedules of Courses Previously Described

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
1	Alfano	Internal Carotid Artery	2 PERIODS W-4, Th-4
2	Allen et al	Bacteriology & Infectious Diseases	8 PERIODS M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5
3	Ascher	Aqueous Veins in Glaucoma	2 PERIODS M-4, M-5
4	Bedell	Medical Ophthalmoscopy	4 PERIODS M-4, T-4, W-4, Th-4
5	Berliner	Slit Lamp Microscopy: Advanced	4 PERIODS M-6, T-6, W-6, Th-6
6	Birge et al	New Theories of Vascular Disease	2 PERIODS T-4, T-5
7	Boeder	Practical Optics	2 PERIODS M-4, M-5
8	Boeder	Aniseikonia & Space Eikonometry	2 PERIODS T-4, T-5
9	Brown et al	Eye Muscles	8 PERIODS M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5
11	Callahan et al	Plastic Surgery: Advanced	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
12	Chace & Lowrey	Ocular Malingering	2 PERIODS M-4, M-5
13	Clark	Surgery of Ocular Muscles	2 PERIODS M-4, M-5
14	Cooper	Accommodative Esotropia	2 PERIODS T-4, T-5
15 or 16	Copeland	Streak Retinoscopy	4 PERIODS M-4, M-5, T-4, T-5 or W-4, W-5, Th-4, Th-5
17	Costenbader et al	Comitant Strabismus	12 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6
18 or 19	DeVoe	Clinical Application of Gonioscopy	2 PERIODS W-4, W-5 or Th-4, Th-5
20	Dunnington & Clark	Retinal Detachment	3 PERIODS M-4, T-4, W-4
21	Fink	Management of Oblique Muscle Problems	3 PERIODS M-5, T-5, W-5
22	Friedenwald & Becker	Studies in Aqueous Flow	2 PERIODS M-4, M-5
23	Gordon	Practical Perimetry	4 PERIODS M-6, T-6, W-6, Th-6
24	Guibor	Orthoptics: Office & Home Technics	3 PERIODS M-4, T-4, W-4
25	Henderson	Neuro-ophthalmology	3 PERIODS M-5, T-5, W-5
26	Hollenhorst	Arterial Diseases	2 PERIODS W-4, W-5
27	Hollinshead	Anatomy of the Orbit	2 PERIODS M-5, M-6
28	Hughes et al	Ophthalmic Plastic Surgery	8 PERIODS M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6

SECTION ON INSTRUCTION

ADVANCE ORDER SHEET

All courses cost $2.00 for each period (one hour). Follow instructions explicitly and check for errors in listing before mailing.

Previous to AUGUST 31

Send order to . . .

WILLIAM L. BENEDICT, M.D., *Executive Secretary-Treasurer*
American Academy of Ophthalmology and Otolaryngology
100 First Avenue Building, Rochester, Minnesota

After AUGUST 31, mail to . . .

WILLIAM L. BENEDICT, M.D., *Executive Secretary-Treasurer*
American Academy of Ophthalmology and Otolaryngology
c/o Waldorf-Astoria Hotel, New York, N. Y.

Academy Candidates and Guests May Purchase Tickets at Instruction Desk, Room 805, Only

(Over)

ADVANCE ORDER SHEET

ORDERS FILLED ONLY IF CURRENT DUES ARE PAID

NO REFUNDS WILL BE MADE AFTER SEPTEMBER 17

(Type or Print) Last Name First Name Middle Initial

Office Address

City Zone State

Days to be Present

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday

Total Amount Enclosed $_____

SELECTION OF COURSES ON REVERSE SIDE OF THIS BLANK

RECAPITULATION OF GENERAL INSTRUCTIONS

1. Monday, Tuesday, Wednesday, and Thursday are represented by the letters M, T, W, Th. The first period in the morning is represented by figure 1, second period by figure 2 and third period by figure 3. The first period in the afternoon is represented by figure 4, second period by figure 5, and third period by figure 6. All courses in oto-laryngology and maxillofacial surgery are presented in the mornings. All courses in ophthalmology are presented in the afternoons.
2. Reservation of instruction tickets in advance of the meeting will be made ONLY for MEMBERS whose 1954 dues have been paid. Academy candidates and guests may make selection of courses ONLY at the Instruction Desk in Room 805, Waldorf-Astoria Hotel, in New York.
3. Make check payable to W. L. Benedict, M.D.
4. Mail order promptly to ensure reservation of first choices. If necessary, an attempt will be made to rearrange schedule to include "first choices."

(Over)

SELECTION OF COURSES

PERIOD	FIRST CHOICE		SECOND CHOICE		THIRD CHOICE	
	Course No.	Lecturer	Course No.	Lecturer	Course No.	Lecturer
MON. 4						
P.M. 5						
6						
TUES. 1						
A.M. 2						
3						
P.M. 4						
5						
6						
WED. 1						
A.M. 2						
3						
P.M. 4						
5						
6						
THURS. 1						
A.M. 2						
3						
P.M. 4						
5						
6						

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
29	Jobe & Lueck	Laboratory Demonstration: Ophthalmic Optics	2 PERIODS W-4, W-5
30	Johnson & Ballintine	Clinical Aqueous Tonography	2 PERIODS M-4, M-5
31 or 32	Katz & Jakus	Anatomy & Histology: Recent Advances	2 PERIODS W-4, W-5 or Th-4, Th-5
33	Knighton et al	Highlights in Glaucoma	8 PERIODS M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6
34	Lloyd	Macular Lesions	3 PERIODS M-6, T-6, Th-5
35	Lyle	Neurologic Lesions	2 PERIODS M-4, M-5
36	McLean et al	Cataract Surgery	12 PERIODS M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6
37	Meyer et al	Glaucoma	8 PERIODS M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5
38	Ogle	Essential Aspects of Binocular Vision	2 PERIODS Th-4, Th-5
39	Paton	Corneal Surgery	3 PERIODS M-6, T-6, W-6
40	Pino & Edwards	Problems of Bifocal & Aphakic Lenses	2 PERIODS T-4, T-5
41	Rolett	Practical Application of Gonioscopy	2 PERIODS M-5, M-6
42	Romaine et al	Ocular Motility	12 PERIODS M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6
43	Sanders et al	Vascular Disease	3 PERIODS M-6, T-6, W-6
44	Schimek & Bousquet	Gonioscopy & Aqueous Outflow Determinations	2 PERIODS M-4, M-5
45	Sloane	School Vision Testing	2 PERIODS M-4, M-5
46	Sloane	Telescopic Lenses	2 PERIODS T-4, T-5
47	Pollen & Gettes	Prescription of Prisms Drugs in Refraction	2 PERIODS W-4, W-5
48	Stow & Moss	Diagnostic & Therapeutic Office Procedures	2 PERIODS Th-4, Th-5
49	Tait	Accommodation & Convergence Abnormalities	2 PERIODS W-4, W-5
50	Theobald et al	Histopathology	12 PERIODS M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6
51	Thorpe et al	Slit Lamp Biomicroscopy	12 PERIODS M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6
52	Thorpe	Surgery of Intraocular Foreign Bodies	2 PERIODS T-4, T-5
53	Wheeler & Knapp	Concomitant Strabismus	6 PERIODS M-5, M-6, T-5, T-6, W-5, W-6
54	Wiener	Practical Points in Surgery	3 PERIODS M-6, T-6, W-6

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Monday

Key M-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
201	Aldrich	Psychosomatic Medicine
203	Alvis	End Results of Cataract Wound Closure
204	Atkinson	Anesthesia
206	Barkan	Congenital Glaucoma
209	Bettman	Value of Goniotomies
212	Calhoun	Dystrophies & Degenerations of the Cornea
214	Chamberlain	Vertical Motor Anomalies
216	Chandler	Cataract Surgery
248	Klien	Clinical Pathology of Retinal Lesions
251	Leahey	Corneal Transplant
252	Leinfelder	Papilledema & Optic Neuritis
253	Lemoine	Vitreous Opacities
A	Home Study	Embryology, Anatomy & Neuro-anatomy

Key M-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
210	Boyes	Eye Surgery Problems
229	Gemeroy	External Diseases of the Eye
233	Goar	Management of Monocular Cataracts
235	Hague	Beta Irradiation
244	Kennedy	Eye Changes in Diabetes
258	Linksz	Telescopic Lenses & Magnifying Systems
280	Rychener	Lacrimal Apparatus
283	Simpson	Convergence Insufficiency & Divergence Excess
299	Whalman	Minor Surgical Procedures of the Eyes
302	Egan	Cross Cylinder Application & Therapy
B	Home Study	Physiology

Key M-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
202	Alvaro	Uveitis: Etiology & Treatment
213	Cassady	Dacryocystitis of Infancy
217	Coston	Interesting Ophthalmoscopic Slides
218	Cusick	Ptosis
221	DeVoe	Corneal Dystrophies
224	Falls	Practical Application of Heredity
234	Guy	Foreign Bodies
239	Harrington	Dynamics of Phacoerisis
241	Hughes	Use of Strontium Applicator
246	Keyes	Intraocular Vascular Disease
247	Kirby	Problems in Presbyopia
257	Lewis	External Diseases
260	Macnie	Head Trauma with Ocular Significance
263	Mann, W.	Optical Correction of Aphakia
277	Post	Infection in Ophthalmology: Preventive Measures
281	Scheie	Emergency Eye Surgery
289	Swan	Ophthalmic Therapeutics
295	Veasey	Refraction Difficulties
298	Weston	Clinical Measurement of Astigmatism
C	Home Study	Refraction

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Tuesday

Key T-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
201	Aldrich	Psychosomatic Medicine
203	Alvis	End Results of Cataract Wound Closure
204	Atkinson	Anesthesia
205	Baker	Neuralgias of Head
209	Bettman	Value of Goniotomies
212	Calhoun	Dystrophies & Degenerations of the Cornea
214	Chamberlain	Vertical Motor Anomalies
220	Davidson	Surgical Instruments: Preparation & Care
226	Fralick	Surgical Anatomy of Operations for Glaucoma
236	Haik	Intraocular Foreign Bodies
250	Kronfeld	Glaucoma Surgery: End Results
251	Leahey	Corneal Transplant
252	Leinfelder	Papilledema & Optic Neuritis
253	Lemoine	Vitreous Opacities
278	Randolph	Handling Patients with Advanced Glaucoma
297	Wendland	Chiasmal Lesions
D	Home Study	External Diseases, Bacteriology & Virology

Key T-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
210	Boyes	Eye Surgery Problems
215	Chamlin	Perimetery: Detection of Minimal Defects
222	Dixon	Indirect Ophthalmoscopy
225	Falls	Ocular Geriatrics
229	Gemeroy	External Diseases of the Eye
235	Hague	Beta Irradiation
240	Harris	Anesthetic Agents & Technics
249	Kornzweig	Practical Embryology
257	Lewis	External Diseases
258	Linksz	Telescopic Lenses & Magnifying Systems
275	Pfeiffer	Roentgenographic Diagnosis
299	Whalman	Minor Surgical Procedures of Eyes
302	Egan	Cross Cylinder Application & Therapy
E	Home Study	Perimetry & Neuro-ophthalmology

Key T-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
202	Alvaro	Uveitis: Etiology & Treatment
213	Cassady	Dacryocystitis of Infancy
217	Coston	Interesting Ophthalmoscopic Slides
218	Cusick	Ptosis
231	Gipner	Recent Advances
234	Guy	Foreign Bodies
238	Harley	Lesions of the 3rd, 4th & 6th Cranial Nerves
239	Harrington	Dynamics of Phacoerisis
241	Hughes	Use of Strontium Applicator
242	Jardon	Fitting of Ocular Prostheses
243	Joy	Angiography in Ophthalmology
246	Keyes	Intraocular Vascular Disease
247	Kirby	Problems in Presbyopia
254	Leopold	Advances in Therapy
260	Macnie	Head Trauma with Ocular Significance
263	Mann, W.	Optical Correction of Aphakia
277	Post	Infection in Ophthalmology: Preventive Measures
282	Scheie	Surgery in Congenital Glaucoma
286	Spaeth	Plastic Surgery: Practical Aspects
295	Veasey	Refraction Difficulties
298	Weston	Clinical Measurement of Astigmatism
F	Home Study	Extraocular Muscles

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Wednesday

Key W-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
205	Baker	Neuralgias of Head
207	Berens	Cyclodiathermy, Iridencleisis, Cyclodialysis
219	Cutler	Procedures Used in Enucleation
223	Dunlap	Divergence Anomalies
228	Fry	Lesions at Posterior Pole of Eye
230	Gifford	Surgical Procedures on Lacrimal Apparatus
236	Haik	Intraocular Foreign Bodies
245	Kestenbaum	Reading Glasses
259	Lowrey	Tropical Opthalmology
262	Mann, M.	Hypertensive Vascular Changes in Fundus
268	Morrison	Office Management of Glaucoma
271	Olson	Iritis, Iridocyclitis & Keratitis
279	Rundles	Streak Retinoscopy
285	Spaeth	Concomitant Strabismus
287	Steffensen	ACTH, Cortisone & Hydrocortisone
G	Home Study	Ophthalmoscopy & Medical Ophthalmology

Key W-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
232	Givner	Systemic Disease
237	Hanser	Studies in Ocular Allergy
240	Harris	Anesthetic Agents & Technics
244	Kennedy	Eye Changes in Diabetes
255	Lepard	Eye Diseases Common to Children
264	McCaslin	Ocular Anesthesia
266	McGuire	Heterophoria & Heterotropia
269	Mullen	Ophthalmic Emergencies
275	Pfeiffer	Roentgenographic Diagnosis
282	Scheie	Surgery in Congenital Glaucoma
292	Theodore	Ocular Therapeutics
294	Townes	Complications of Cataract Surgery
300	Wise	Fundus Changes of the Optic Nerve Head
H	Home Study	Pathology

Key W-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
208	Berke	Surgery of Oblique Muscles
221	DeVoe	Corneal Dystrophies
227	Fread	Ideal Refraction Equipment
231	Gipner	Recent Advances
261	Mangold	Proper Fitting of Glasses
265	McGraw	Contact Lenses
267	Merriam	Radio Therapy
270	Murphy	Preparation of Ophthalmic Medications
272	Paulson	Lighting for Comfortable and Accurate Seeing
273	Payne	Unilateral Visual Failure Due to Intracranial Lesions
274	Perera	Retinal Detachment
276	Posner	Glaucomatocyclitic Crises
284	Smith	Practical Points in Office Procedure
288	Stimson	Lenses for the Aphakic
290	Tabor	Vertical Muscles
291	Tassman	Retinopathy in Diabetics
293	Town	Adjuncts in Wound Closure
296	Veirs	External Dacryocystorhinostomy & Modified Stallard Procedure
301	Wood	Macular Lesions
I	Home Study	Pharmacology & Therapeutics

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Thursday

Key Th-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
219	Cutler	Procedures Used in Enucleation
223	Dunlap	Divergence Anomalies
230	Gifford	Surgical Procedures on Lacrimal Apparatus
245	Kestenbaum	Reading Glasses
248	Klien	Clinical Pathology of Retinal Lesions
256	Levy	Motion Picture Photography: Methods & Highlights
262	Mann, M.	Hypertensive Vascular Changes in Fundus
264	McCaslin	Ocular Anesthesia
268	Morrison	Office Management of Glaucoma
271	Olson	Iritis, Iridocyclitis & Keratitis
279	Rundles	Streak Retinoscopy
285	Spaeth	Concomitant Strabismus
287	Steffensen	ACTH, Cortisone & Hydrocortisone
297	Wendland	Chiasmal Lesions
J	Home Study	Optics & Principles of Biomicroscopy

Key Th-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
222	Dixon	Indirect Ophthalmoscopy
237	Hanser	Studies in Ocular Allergy
266	McGuire	Heterophoria & Heterotropia
292	Theodore	Ocular Therapeutics
294	Townes	Complications of Cataract Surgery
300	Wise	Fundus Changes of the Optic Nerve Head
J	Home Study	Continuation of Th-4

Key Th-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
227	Fread	Ideal Refraction Equipment
261	Mangold	Proper Fitting of Glasses
265	McGraw	Contact Lenses
267	Merriam	Radio Therapy
270	Murphy	Preparation of Ophthalmic Medications
273	Payne	Unilateral Visual Failure Due to Intracranial Lesions
274	Perera	Retinal Detachment
284	Smith	Practical Points in Office Procedure
288	Stimson	Lenses for the Aphakic
290	Tabor	Vertical Muscles
291	Tassman	Retinopathy in Diabetics
293	Town	Adjuncts in Wound Closure
296	Veirs	External Dacryocystorhinostomy & Modified Stallard Procedure
301	Wood	Macular Lesions

CONTINUOUS COURSES AND PANEL DISCUSSIONS
OTOLARYNGOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
101	Altmann & Waltner	Histopathology of Ear—Part I	2 PERIODS T-1, T-2
102	Altmann & Waltner	Histopathology of Ear—Part II	2 PERIODS W-1, W-2
103	Boies et al	Rhinologic Problems	2 PERIODS W-2, W-3
104 or 105	Bryan & Bryan	Cytologic Pathology in the Differential Diagnosis of ENT Diseases	2 PERIODS T-2, T-3 or W-2, W-3
106 or 107	Cohen	Rhinoplasty Complications	2 PERIODS T-2, T-3 or Th-2, Th-3
108 or 109	Conley, et al	Cancer of Head & Neck	2 PERIODS T-1, T-2 or Th-1, Th-2
110	Converse	Nasal Plastic Surgery—Basic	2 PERIODS T-1, T-2
111	Converse	Nasal Plastic Surgery—Advanced	2 PERIODS W-1, W-2
112 or 113	Cullen, et al	Anesthesia for Otolaryngologic Surgery	2 PERIODS T-2, T-3 or W-2, W-3
114 or 115	Day & Walsh	What Can Be Done for Deafness	2 PERIODS T-2, T-3 or W-2, W-3
116	Furstenberg, et al	Tumors & Cysts of the Head & Neck	2 PERIODS W-1, W-2
117 or 118	Hansel	Allergy	2 PERIODS T-2, T-3 or Th-2, Th-3
119 or 120	Hardy & Pauls	Special Audiometry in Differential Diagnosis	2 PERIODS W-1, W-2 or Th-1, Th-2
121	Hoople, et al	Fluid Ears	2 PERIODS T-2, T-3
122 or 123	Huffman	Plastic Surgery	2 PERIODS T-1, T-2 or Th-1, Th-2
124	Jackson	Peroral Endoscopy	3 PERIODS T-1, W-1, Th-1
125	Kazanjian, et al	Traumatic Injuries of Face	2 PERIODS Th-2, Th-3
126 or 127	Lindsay	Vertigo	2 PERIODS W-2, W-3 or Th-2, Th-3
128 or 129	Marcus, et al	Hearing Problems in Children	2 PERIODS T-1, T-2 or Th-1, Th-2
130 or 131	McLaurin et al	External Otitis	2 PERIODS W-2, W-3 or Th-2, Th-3
132 or 133	Meltzer, et al	Otological Problems	2 PERIODS T-2, T-3 or W-2, W-3
134 or 135	Moses	Speech & Voice Therapy	2 PERIODS T-1, T-2 or Th-1, Th-2
136 or 137	Mueller, et al	Hearing Aids	2 PERIODS W-2, W-3 or Th-2, Th-3
138 or 139	Priest, et al	Medication for the Otolaryngologist	1 PERIOD T-1 or W-1
140	Raum et al	Pathology—I	3 PERIODS T-1, T-2, T-3
141	Raum et al	Pathology—II	3 PERIODS W-1, W-2, W-3
142	Raum et al	Pathology—III	3 PERIODS Th-1, Th-2, Th-3
143	Scheldrup	Anatomy of the Neck	2 PERIODS T-2, T-3
144 or 145	Sellers	Dizziness, Dysacousis & Disesthesia	2 PERIODS W-1, W-2 or Th-1, Th-2
146 or 147	Seltzer	A Typical Rhinoplasty	2 PERIODS W-2, W-3 or Th-2, Th-3
148 or 149	Semenov	Therapy in Pathology of ENT	2 PERIODS T-1, T-2 or W-1, W-2
150 or 151	Tucker, et al	Esophageal Diseases & Foreign Bodies	2 PERIODS T-2, T-3 or W-1, W-2
152 or 153	Williams et al	Head Pain	2 PERIODS T-1, T-2 or W-1, W-2

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Tuesday

Key T-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
401	Alexander	The Adenoid Operation
402	Becker	Plastic Surgery of Protruding Ears
407	Brodnitz	The Actor & Singer in ENT Practice
410	Carpenter & Goff	Respiratory & Swallowing Problems in the Newborn
413	Coleman	Practical Psychosomatic Aspects
414	Corgill	Laryngopharyngectomy & Bilateral Neck Dissection
417	Crispell	Allergy in Children
421	DeWeese	The Dizzy Patient
424	Furchgott	Hearing Disorders
434	Hickey	Tumors of the Nasal Septum
439	Holinger	Pediatric Laryngology
446	Johnson	Anesthesia in Adult Tonsillectomies
450	Jordan, R. E.	Allergy in Otology
459	Lederer	Diagnostic Approaches & Recent Trends
460	LeJeune	Intralaryngeal Surgery
465	Long	Sulfonamides & Antibiotics in Respiratory Infections
471	Missal	Skin Tests in Allergy
477	Orton	Surgical Considerations of the Neck
483	Reger	Practical Office Audiometry
485	Richards	Suggestions Concerning Office Practice
494	Schenck	Physiology of the Lymph Tissue
495	Schuknecht	Perceptive Deafness: Differential Diagnosis
498	Shambaugh	Practical Office Routine in Otologic Problems
504	Thornell	Intralaryngeal Arytenoidectomy
512	Woodman	Glottic Obstruction
513	Work	Wide Field Laryngectomy

Key T-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
403	Beinfield	Management of Nasal Hemorrhage
405	Boyden	Chronic Frontal Sinus Surgery
406	Brandenburg	Understanding the Problem Patient
409	Canfield	Audiology for the Practicing Otologist
411	Cody	Management of Eustachian Tubal Pathology
428	Goodyear	Maxillary Sinus Disease
448	Jones, L. T.	Tear Sac Surgery
451	Juers	Hearing Tests
454	Kemler	Focal Infections: Upper Respiratory Tract
467	McBean	Severe Nosebleed
475	Neivert	Workshop for Deformed Instruments
478	Pearlman	ENT Complaints in Old Age
482	Rawlins	ACTH, Cortisone & the Antihistaminic Drugs
484	Reger	Detection of Auditory Malingering
490	Salinger & Cohen, B. M.	Septum Correction & Rhinoplasty
507	Tschiassny	Labyrinthine Tests
510	Von Leden	Dissection in Continuity
511	Wilson	Otoplasty for Protruding Ears
514	Wynn	Facial Injuries: Plastic Repair

Key T-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
408	Brown	Chronic Suppurative Otitis Media
415	Costen	Mandibular Joint Syndrome
416	Craft	Nasal Allergy
418	Davies	Development of Face & Ear
420	Derlacki	Role of Allergy in Deafness
427	Goodhill	Management of Tinnitus
431	Harrill	Bronchography
432	Harris	Poliomyelitis: Respiratory Complications
433	Hedgecock	Clinical Audiometry
436	Hilger	Therapeutic Approaches to the Inner Ear
437	Hill	Antro-Alveolar Fistulas
438	Hilsinger	Vascular Headaches
452	Keaster	Speech & Hearing in Children Under Five
455	Kinney	Hearing Impairments in Children
456	Kobrak	Treatment of Middle Ear Deafness
462	Lempert	Temporal Bone Surgery
470	Miller	Laryngeal Emergencies in Infants & Children
472	Moore	Eustachian Tube Problems
474	Nash	Occupational Deafness
476	Ogura	Laryngectomy & Neck Dissection
486	Rinkel	Food Allergy in Oto-laryngologic Practice
487	Roberts	Management of Nasal Fractures
500	Sisson	Carcinoma of Head & Neck: Surgical Principles
501	Skolnik	Cleft Palate
505	Tingwald	Maxillary Sinus Disease
506	Tremble	Practical Therapeutics in Office Practice
509	Van Alyea	Chronic Sinusitis

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Wednesday

Key W-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
401	Alexander	The Adenoid Operation
404	Bellucci	Submucous Resection of Nasal Septum
410	Carpenter & Goff	Respiratory & Swallowing Problems in the Newborn
412	Cohen, S.	Deviated Noses & Their Correction
414	Corgill	Laryngopharyngectomy & Bilateral Neck Dissection
417	Crispell	Allergy in Children
421	DeWeese	The Dizzy Patient
423	Friedman & Marquit	Plastic Surgery of the Nose & Face
424	Furchgott	Hearing Disorders
434	Hickey	Tumors of the Nasal Septum
435	Hilger	Direct Fixation of Facial Fractures
441	Hosler	Cardiac Arrest
442	House	Surgery of Chronically Discharging Ear
445	Ireland	Common Sense Treatment of the Office Patient
446	Johnson	Anesthesia in Adult Tonsillectomies
447	Jones, A. C.	Helpful Hints for Everyday Practice
451	Juers	Hearing Tests
461	Lempert	Diagnosing Type of Hearing Loss
466	Maxwell	Tumors of Face & Neck in Infancy & Childhood
468	McNally	Labyrinthine Tests
471	Missal	Skin Tests in Allergy
473	Morrison	Laryngeal Paralysis
481	Putney	Surgery of Neck Tumors
497	Seltzer	Abrasion of the Face
499	Shuster	Vestibular Apparatus
515	Zizmor	Roentgen Diagnosis

Key W-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
403	Beinfield	Management of Nasal Hemorrhage
406	Brandenburg	Understanding the Problem Patient
411	Cody	Management of Eustachian Tubal Pathology
419	Davison	Use of Antibiotics
443	House	Atresia of the Ear Canal
449	Jordan, L. W.	Nasal Fractures
453	Keim	Management of Parotid Tumors
457	Kos	Inflammatory Perforation of the Ear Drum
467	McBean	Severe Nosebleed
469	McQuiston	Endaural Radical Mastoidectomy
475	Neivert	Workshop for Deformed Instruments
480	Pressman	Partial Laryngectomies
482	Rawlins	ACTH, Cortisone & the Antihistaminic Drugs
488	Robison	Allergic Sinusitis: Treatment
490	Salinger & Cohen, B. M.	Septum Correction & Rhinoplasty
491	Schall	Cancer of the Nose & Sinuses
492	Schattner	Rhinoplasty by Reassembly of Nasal Elements
513	Work	Wide Field Laryngectomy

Key W-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
415	Costen	Mandibular Joint Syndrome
422	Erich	Fractures of Facial Bones
425	Glorig	Hearing Aid Selection
426	Goldman	Vasomotor Rhinitis
429	Hampsey	Sinusitis in Children
430	Harbert	Clinical Audiology
432	Harris	Poliomyelitis: Respiratory Complications
437	Hill	Antro-Alveolar Fistulas
438	Hilsinger	Vascular Headaches
439	Holinger	Pediatric Laryngology
440	Holmes	Scars of the Face
444	Hunnicutt	The Chronically Congested Nose
452	Keaster	Speech & Hearing in Children Under Five
455	Kinney	Hearing Impairments in Children
458	Lassman	Prescription of Hearing Aids
462	Lempert	Temporal Bone Surgery
470	Miller	Laryngeal Emergencies in Infants & Children
479	Perlman	Serous Otitis
489	Ryan	Headache
493	Scheldrup	Autonomic Neuro-anatomy of Head & Neck
500	Sisson	Carcinoma of Head & Neck: Surgical Principles
502	Slaughter	Congenital Deformity of the Ear
503	Sullivan	Facial Paralysis & Bell's Palsy
505	Tingwald	Maxillary Sinus Disease
510	Von Leden	Dissection in Continuity
514	Wynn	Facial Injuries: Plastic Repair

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Thursday

Key Th-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
402	Becker	Plastic Surgery of Protruding Ears
404	Bellucci	Submucous Resection of the Nasal Septum
407	Brodnitz	The Actor & Singer in ENT Practice
418	Davies	Development of Face & Ear
422	Erich	Fractures of Facial Bones
423	Friedman & Marquit	Plastic Surgery of the Nose & Face
431	Harrill	Bronchography
440	Holmes	Scars of the Face
441	Hosler	Cardiac Arrest
442	House	Surgery of Chronically Discharging Ear
447	Jones, A. C.	Helpful Hints for Everyday Practice
453	Keim	Management of Parotid Tumors
454	Kemler	Focal Infections: Upper Respiratory Tract
461	Lempert	Diagnosing Type of Hearing Loss
463	Lewy	Direct Laryngoscopy
465	Long	Sulfonamides & Antibiotics in Respiratory Infections
466	Maxwell	Tumors of Face & Neck in Infancy & Childhood
468	McNally	Labyrinthine Tests
472	Moore	Eustachian Tube Problems
477	Orton	Surgical Considerations of the Neck
479	Perlman	Serous Otitis
485	Richards	Suggestions Concerning Office Practice
495	Schuknecht	Perceptive Deafness: Differential Diagnosis
497	Seltzer	Abrasion of the Face
498	Shambaugh	Practical Office Routine in Otologic Problems
504	Thornell	Intralaryngeal Arytenoidectomy
508	Van Alyea	Embryology of ENT
512	Woodman	Glottic Obstruction

Key Th-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
405	Boyden	Chronic Frontal Sinus Surgery
413	Coleman	Practical Psychosomatic Aspects
419	Davison	Use of Antibiotics
428	Goodyear	Maxillary Sinus Disease
430	Harbert	Clinical Audiology
443	House	Atresia of the Ear Canal
448	Jones, L. T.	Tear Sac Surgery
449	Jordan, L. W.	Nasal Fractures
450	Jordan, R. E.	Allergy in Otology
457	Kos	Inflammatory Perforation of the Ear Drum
458	Lassman	Prescription of Hearing Aids
464	Lieberman	Histopathology of Hearing Impairments
469	McQuiston	Endaural Radical Mastoidectomy
478	Pearlman	ENT Complaints in Old Age
481	Putney	Surgery of Neck Tumors
488	Robison	Allergic Sinusitis: Treatment
489	Ryan	Headache
491	Schall	Cancer of the Nose & Sinuses
492	Schattner	Rhinoplasty by Reassembly of Nasal Elements
493	Scheidrup	Autonomic Neuro-anatomy of Head & Neck
511	Wilson	Otoplasty for Protruding Ears
515	Zizmor	Roentgen Diagnosis

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Course No.	SPEAKER	SUBJECT
408	Brown	Chronic Suppurative Otitis Media
409	Canfield	Audiology for the Practicing Otologist
416	Craft	Nasal Allergy
420	Derlacki	Role of Allergy in Deafness
425	Glorig	Hearing Aid Selection
426	Goldman	Vasomotor Rhinitis
427	Goodhill	Management of Tinnitus
429	Hampsey	Sinusitis in Children
433	Hedgecock	Clinical Audiometry
436	Hilger	Therapeutic Approaches to the Inner Ear
444	Hunnicutt	The Chronically Congested Nose
445	Ireland	Common Sense Treatment of the Office Patient
456	Kobrak	Treatment of Middle Ear Deafness
459	Lederer	Diagnostic Approaches and Recent Trends
460	LeJeune	Intralaryngeal Surgery
473	Morrison	Laryngeal Paralysis
474	Nash	Occupational Deafness
476	Ogura	Laryngectomy & Neck Dissection
480	Pressman	Partial Laryngectomies
486	Rinkel	Food Allergy in Otolaryngologic Practice
487	Roberts	Management of Nasal Fractures
499	Shuster	Vestibular Apparatus
502	Slaughter	Congenital Deformity of the Ear
503	Sullivan	Facial Paralysis & Bell's Palsy
506	Tremble	Practical Therapeutics in Office Practice
507	Tschiassny	Labyrinthine Tests

BOOK REVIEW

ANATOMY FOR SURGEONS: Vol. 1. By W. Henry Hollinshead, Ph.D. Price $12.00. Pp. 560, with 326 illustrations. Paul B. Hoeber, Inc., 49 East 33rd Street, New York 16, N. Y.

This book is a clear presentation of human anatomy for the use of the surgeon who must bear in mind anatomic data from the standpoint of functional relations as well as the systematic development of the human body. Volume 1 deals with the surgical anatomy of the head and neck in sections of surgical significance, viz.: The Cranium, The Orbit, The Ear, The Nose and Paranasal Sinuses, The Fascia and Fascial Spaces of the Head and Neck, The Face, The Jaws, Palate and Tongue, The Pharynx and Larynx, and The Neck. Throughout the text the author not only describes the anatomic structures as he uncovers them in dissection but alludes to disease conditions that are treated surgically and how they are to be regarded from a surgical standpoint. Operative technics, however, are not discussed. References to texts and atlases are frequently interspersed, and many of the illustrations are adopted from familiar works.

The author has profited from years of teaching anatomy to graduate surgeons and approaches the subject from a clinical standpoint. Detailed anatomic relations are mentioned but not stressed, as one example shows: "All three of the motor nerves to the orbit pass through the cavernous sinus, and therefore through the middle cranial fossa; their relationships within the sinus to each other are described in detail in connection with the orbit, but are actually of relatively little clinical importance: the nerves are so closely grouped here that a lesion—for instance, an aneurysm of the internal carotid, or an adenoma of the hypophysis—is very apt to affect all three nerves simultaneously, causing a complete ophthalmoplegia." There is a comprehensive bibliography with each chapter.

This form of presentation of surgical anatomy has been tested and used for several years in graduate teaching, and its value was known before the book was available. Surgeons of the head, face and neck will find here just what they have been looking for. Future volumes of the Anatomy for Surgeons will cover The Thorax, Abdomen and Pelvis, and The Back and Limbs. The divisions are based on book bulk rather than fields of interest, so every surgeon will want the complete set.

WILLIAM L. BENEDICT, M.D.

Rochester, Minnesota
April 13, 1954

News - - - Notes

AMERICAN ORTHOPTIC COUNCIL

The annual examination of orthoptic technicians by the American Orthoptic Council will be conducted in July and September 1954.

The written examination will be non-assembled and will take place on Thursday, July 22, in certain assigned cities and offices, and will be proctored by designated ophthalmologists.

The oral and practical examinations will be held on Saturday, September 18, in New York City, just preceding the meeting of the American Academy of Ophthalmology and Otolaryngology.

Application for examination will be received by the office of the Secretary of the American Orthoptic Council, Dr. Frank D. Costenbader, 1605 22nd St. N. W., Washington 8, D. C., and must be accompanied by the examination fee of $30. Applications will not be accepted after June 1, 1954.

PAN-AMERICAN CONGRESS OF OPHTHALMOLOGY

The Pan-American Association of Ophthalmology will hold its Third Interim Congress, June 17 to 21 in Sao Paulo, Brazil, under the presidency of Dr. Moacyr E. Alvaro of Sao Paulo. The meeting is of special interest because it is one of many official events in the celebration of the quadricentennial of the host city this year.

The scientific program includes papers by several physicians of the United States including Dr. Ray K. Daily, Houston, Texas, "Intraocular and Orbital Tumors"; Dr. H. Saul Sugar, Detroit, "Acute Inflammatory Glaucoma"; Dr. W. Banks Anderson, Durham, N. C., "Diseases of the Retina"; Dr. Curtis Benton, Jr., Fort Lauderdale, Fla., with Dr. Jorge Valdeavellano of Lima, Peru, "Diseases of the Optic Nerve"; Dr. Murray McCaslin, Pittsburgh, "Medical Treatment of Strabismus"; and Dr. Charles L. Schepens, Boston, "Surgery of Retinal Detachment."

Papers by ophthalmologists of the other countries of the hemisphere include the following: Dr. Santiago Barrenechea, Santiago, Chile, "Simple Chronic Glaucoma"; Dr. Baudilio Courtis, Buenos Aires, Argentina, "Correction of Ametropias"; Dr. Washington Isola, Montevideo, Uruguay, "Lids and Lacrimal Apparatus"; Dr. Humberto Escapini, San Salvador, El Salvador, "The Orbit"; Dr. Henri Pichette, Quebec, Canada, "Uveitis"; Dr. Rebelo Neto, Sao Paulo, "Plastic Operations on the Lids"; and Dr. Jose Angel Ramirez and Dr. Luis E. Mendez, Caracas, Venezuela, "Surgical Treatment of Concomitant and Paralytic Strabismus."

Presentations will be in English, Spanish or Portuguese, with simultaneous translations into the other two languages.

There will be a registration fee of $10, which will cover many special events, as well as attendance at two other congresses which will be meeting at the same time. These are the Eighth Brazilian Congress of Ophthalmology and the Nineteenth International Congress of Oto-Neuro-Ophthalmology. Attendance is not limited to members of the Pan-American Association of Ophthalmology, Dr. Alvaro has announced.

The Pan-American Association of Ophthalmology was founded in 1939 by a committee consisting of the late Dr. Harry S. Gradle, Chicago, who was its first president; Dr. Conrad Berens, New York, the second president, and Dr. Alvaro, the present president. Congresses were held in Cleveland in 1940; in Montevideo, Uruguay, in 1945; in Havana, Cuba, in 1948, and in Mexico City in 1952. The first Interim Congress met in Miami Beach, Florida, in 1950, and the second on a Caribbean cruise in 1953.

CALIFORNIA

The Uveitis Laboratory, Medical Research Department of Ophthalmology, University of California Medical Center, San Francisco 22, California, urgently requests all physicians to send freshly enucleated eyes from cases of diffuse uveitis, iridocyclitis and chorioretinitis for cultural and pathological studies. The eyes should be placed in a sterile bottle, **not** fixed in formalin and sent as quickly as

possible, air express collect to Dr. Michael J. Hogan, Director, Francis I. Proctor Foundation for Research in Ophthalmology. A complete report will be sent on each specimen received.

They would also like to obtain formalin-fixed specimens of similar eyes for pathology study.

MAINE

For the second consecutive year Colby College in Waterville, Maine, will present, August 8 to 14, its course "Audiology for Industry."

This course is designed to enable industrial physicians and plant engineers to determine noise levels which might result in acoustic trauma and to set up programs to protect the ears of workers in heavy industry. The faculty will consist of leading authorities in this field.

Registrants will live on the college's new Mayflower Hill campus. The tuition fee of $200 includes board and room. Applications should be made to Ralph S. Williams, Director, Adult Education, Colby College, Waterville, Maine.

MASSACHUSETTS

Dr. Frank B. Walsh, Associate Professor of Ophthalmology, Johns Hopkins Hospital and University, delivered the Howe Lecture of Ophthalmology, "A Clinical Study of Several Third Nerve Lesions," on Tuesday, April 20, 1954, at the Harvard Medical School.

This Lecture is given under the auspices of the Howe Laboratory of Ophthalmology, Harvard Medical School and Massachusetts Eye and Ear Infirmary.

MISSOURI

The Leslie Dana Gold Medal, awarded annually by the St. Louis Society for the Blind for outstanding achievements in the prevention of blindness and the conservation of vision, was conferred upon Mrs. Audrey H. Gradle, Sherman Oaks, California, at a Conference Luncheon of the National Society for the Prevention of Blindness in St. Louis, on Thursday, March 11.

TENNESSEE

Dr. Sam H. Sanders, Jr., has been named head of the Department of Otology, Laryngology and Rhinology at the University of Tennessee College of Medicine, succeeding Dr. Charles Blassingame, who asked to be relieved of his administrative duties. Dr. Blassingame will continue as professor in the department.

Dr. Sanders has been on the staff of the College of Medicine since 1928. He was named associate professor in 1949. He is a graduate of the University of Tennessee College of Medicine, 1927.

Dr. Sanders served as secretary of the A.M.A. Section on Laryngology, Rhinology and Otology from 1950 through 1953, and is now serving as chairman of the Section. He has also held similar positions in state and local otolaryngologic societies. He is a Fellow of the Academy, and holds membership in other national and international societies devoted to otolaryngology and allergy.

VIRGINIA

The Gill Memorial Eye, Ear and Throat Hospital has just completed its Twenty-Seventh Annual Spring Congress in ophthalmology and otolaryngology and the allied specialties.

The faculty was composed of twenty-three guest speakers. There was an attendance of two hundred and seventy-five doctors representing forty-two states, Canada and one foreign country.

The Twenty-Eighth Annual Spring Congress will be held April 4 to 9, 1955.

GREECE

At the December 1953 meeting of the Greece Society of Ophthalmology, Dr. Milton Berliner was elected honorary member as an indication of the appreciation of the Society for his contribution to Ophthalmology.

POSITIONS AVAILABLE

Wanted for July 1st, 1954 two residents in Ophthalmology (must have completed an approved Basic Science course) two years' approval; stipend to start $175.00 plus full maintenance. Address Dr. B. I. Burns, Kansas City General Hospital No. 1, Kansas City, Missouri for full particulars.

Residencies in ophthalmology will be available July 1, 1954, at the University of Texas, Medical Branch Hospitals, Galveston, Texas. A new nine-story addition to the Hospital has just been opened. Twenty-six beds are allocated for eye. There is a large out-patient service. Good opportunity is offered for clinical, surgical and research training in approved residencies. Training in basic ophthalmology is required. For further information write Dr. Gaynelle Robertson, Acting Chairman, Department of Ophthalmology, University of Texas Medical Branch, Galveston, Texas.

Residency in ophthalmology, two years, beginning July 1, 1954. Address Sydney C. Peimer, Assistant Director, The Jewish Hospital of Brooklyn, 555 Prospect Place, Brooklyn 38, N. Y.

Ophthalmology Residence: As a result of expansion in the resident training program there will be an additional opening for an assistant residency in Ophthalmology in this fully approved medical school Ophthalmology Service for July 1, 1954. In addition to an extremely busy outpatient surgical service, there is opportunity for active participation in the medical school teaching program and an active research program. Address inquiries to Dr. Winston Roberts, Director of Ophthalmology, Bowman Gray School of Medicine, North Carolina Baptist Hospital, Winston-Salem, North Carolina.

Information regarding a Research Fellowship in Ophthalmology at Indiana University Medical Center may be obtained by writing to Dr. T. F. Schlaegel, Jr., 1100 West Michigan Street, Indianapolis 7, Indiana. It is not necessary to have had training in ophthalmology to be accepted for this position. For those who have not had a graduate course in ophthalmology, the fellowship will provide some training prior to a residency. Fellows assist in the eye clinic and at eye surgery and attend the formal classes for eye residents. The stipend is $1,800 per year, plus room and laundry.

Fellowship in Allergy and Otolaryngology for a period of three months with a stipend of $200.00 per month. For further information, write to French K. Hansel, M.D., 1229 Missouri Theatre Building, 634 N. Grand Boulevard, St. Louis 3, Mo.

Location available: Otolaryngologist or ophthalmologist to assume practice of late Dr. W. D. and Dr. James P. Gill in San Antonio, Texas. Equipment can be bought, if desired, but not required. Address inquiries to G. D. Boyd, M.D., 1411 N. Main Avenue, San Antonio, Texas.

Listings of positions available should be sent to W. L. Benedict, M.D., 100 First Avenue Building, Rochester, Minn., by the fifth of the month preceding publication. They should include (1) type of physician wanted (ophthalmologist or otolaryngologist; diplomate, resident, etc.); (2) type of position to be filled; and (3) whom to write for further information. Unless otherwise requested, listings will be published once only.

The Academy will handle no further correspondence beyond the listing and assume no responsibility. Neither does it endorse nor guarantee any of the published listings.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Round Table Discussion Cruise

To Members of the A.A.O.O. and their friends we offer rooms on the "Queen of Bermuda" for the **Round Table Discussion Cruise** similar to the following types while they last. What is your choice?

			Old Rates		**New Rates**
Deck E, Room	316	inclusively priced at	$179.55	each of two in room.	$173.30
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	231		225.55	ADJUSTED TO	217.30
Deck C	137	ARE SHOWN	214.05	MEET LOWERED	206.30
	158		225.55		217.30
	156	FOR	231.30	TRANSPOR-	222.80
	140		242.80	TATION TAX.	233.80
Deck B	32	INFORMATION	225.55	GOOD NEWS,	217.30
	34		242.80		233.80
	47	ONLY.	265.80	EH?	255.80
DeLuxe	"T"		323.30		310.80
Single Room	like 327 on Deck E at		$202.80;	like 9 on Sun Deck at	$273.80
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The above chart shows **Room Types** and their **inclusive prices.*** We promise no particular room until it has been definitely confirmed to you and the deposit paid. What type room would you like? **Do not delay** your choice.

The Round Table Discussions on shipboard are an integral part of the Annual Meeting. **Full program** will be announced later.

***Above Prices Include:** Room with private bath, all meals, and all privileges on the "Queen of Bermuda" for the round trip; Federal and Bermuda taxes. A complete package. (Note the change.) The ship will be used as our hotel in Bermuda. The Princess Hotel plans a major reconstruction project to begin in mid-September so we were obliged to release our reservations there.

All cabins on the ship are roomy regardless of Deck. All have the same ventilation under the control of the occupant. All have the same quality of equipment. All carry the same privileges. There is only one class — First Class.

Act Quickly. All peak season sailings, and this is one, are sold out long in advance. You gain everything and lose nothing through an early choice. If you **hope** to go why not **decide today** and let me know the type of room you wish.

The Doposit is $50.00 per person. If some emergency compels you to change your plans later, your deposit will be refunded promptly. The advantage is all yours.

Make your checks payable to Leon V. Arnold and send to Leon V. Arnold, Travel Consultant, Hotel Holley, 33 Washington Square West, New York, N.Y.

No Passports are required for United States or Canadian citizens but all should carry some form of identification.

Dress will be very largely informal for the entire cruise.

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Literature on request.

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